THE MYSTERY OF THE SUNDARBANS

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DEDICATION

In warm appreciation and grateful acknowledgement of their inspiration to me for pursuing my research on the Sundarbans, this volume is dedicated to

Mr. Asim Kumar Sen,
Retired Joint Director,
Directorate of Fishery,
Government of West Bengal

Mr. Sanat Kumar Das, I.F.S.
Regional Deputy Director,
Wild Life Preservation,
Eastern Region, Government of India

Mr. Ramendra Nath Bhattacharyya,
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Dr. Ardhendu Mukherjee,
Retired Reader in the Deptt. of Bengali Language and Literature, Fakirchand College,
Diamond Harbour

Author's Research Publications

The Sepoy Mutiny (1857), a social study and analysis
Indians in Africa, a socio-economic study
Indians in Sri Lanka, a historical study
History of Japan (in Bengali)
History of China (in Bengali)
Internal migration in India, a case study of Bengal
Ethnic unrest in modern Sri Lanka
From Marsh to Township east of Calcutta
A tale of Salt Water Lake and Salt Lake Township (Bidhan Nagar)
Migration between India and Nepal, a Socio-Cultural Study
The mystery of the Sundarbans
A brief history of South Africa (in Bengali) — in manuscript form (ready for the press)

Preface

The present study owes its origin to the inspiration and encouragement received from Mr. Asim Kumar Sen, Retired Joint Director, Directorate of Fishery, Government of West Bengal, and from Mr. Sanat Kumar Das, I. F. S. I am indebted to them for their valuable advice and suggestions and for material help as well. As I proceeded further in my hunt of records I got in touch with many other scholars, all experts in my field of research. Professor Amalesh Chaudhury, the then Head of the Department of Marine Science, Calcutta University, and one of the most distinguished Mangrove Scientists in India, was of much help to me in understanding the intricacies of the mangrove plantation in the Sundarbans area. I am grateful to him. I also recollect with gratitude the help I got from Dr. Kalyan Chakravarti, I.F.S., whose 'Bagh O Manus' in Bengali throws a flood of light on the life of the Royal Bengal Tigers in relation to human beings. Dr. Kishori Ghosh and his worthy consort, Mrs. Laboni Ghosh, helped me much by securing some documents needed by me. Mr. Ramendra Nath Bhattacharyya, my ever-abiding well-wisher and a learned neighbour of mine, stood me in good stead by helping me to correct the proofs, besides offering valuable suggestions. Occasionally I used to call on Dr. N. Goswami, Curator, Asutosh Museum, Calcutta University, to get some ticklish points of my study explained by him. I bow my thanks to him. Dr. Dilip Mitra, Deputy Librarian (now retired), National Library, was kind enough to make available to me significant references to different headings of my subject. I am grateful to Dr. Mitra. I take the opportunity to thank Dr. Gautam Sengupta, Director, Department of Archaeology, Government of West Bengal, for his kind help to me.

In the course of collecting my materials at the Sundarbans Development Board at Salt–Lake, I received a lot of information about the Sundarbans Development Board and the Sundarbans Biosphere Reserve from the then Member-Secretary, Mr. S. R. Bhowmick, IAS. To him I offer my heart-felt thanks. His worthy colleague, Mr. P. N. Dasgupta, the then Deputy Director of the Board, stood me in good stead by giving me every possible assistance I required. I bow my thanks to him. Dr. Ardhendu Mukherjee, formerly Reader at the Fakir Chand College, Diamond Harbour, and Dr. Ahindra Kumar Mondal of the same institution helped me, as on previous occasions, with their practical suggestions. I had also the privilege of consulting documents at the Library of the Forest Department, Government of West Bengal, and, above all, at the National Library, Calcutta. But for the generous

help and cooperation offered by the staff of the National Library I doubt if my work could have taken shape. I bow my thanks to them. I am also thankful to Dr. (Mrs.) Kshanika Saha, Reader in the Department of Ancient Indian History and Culture, University of Calcutta, and to Mr Anil Banerjee, W.B.C.S. (Retd), for the interest taken by them in my work.

The materials collected from the aforesaid sources helped me to weave the woof and warp of the present study.

Lastly, I take this opportunity to thank my respectable publishers, A. Mukherjee and Co. Private Ltd., for kindly undertaking the publication of the Mystery of the Sundarbans.

Haraprasad Chattopadhyaya

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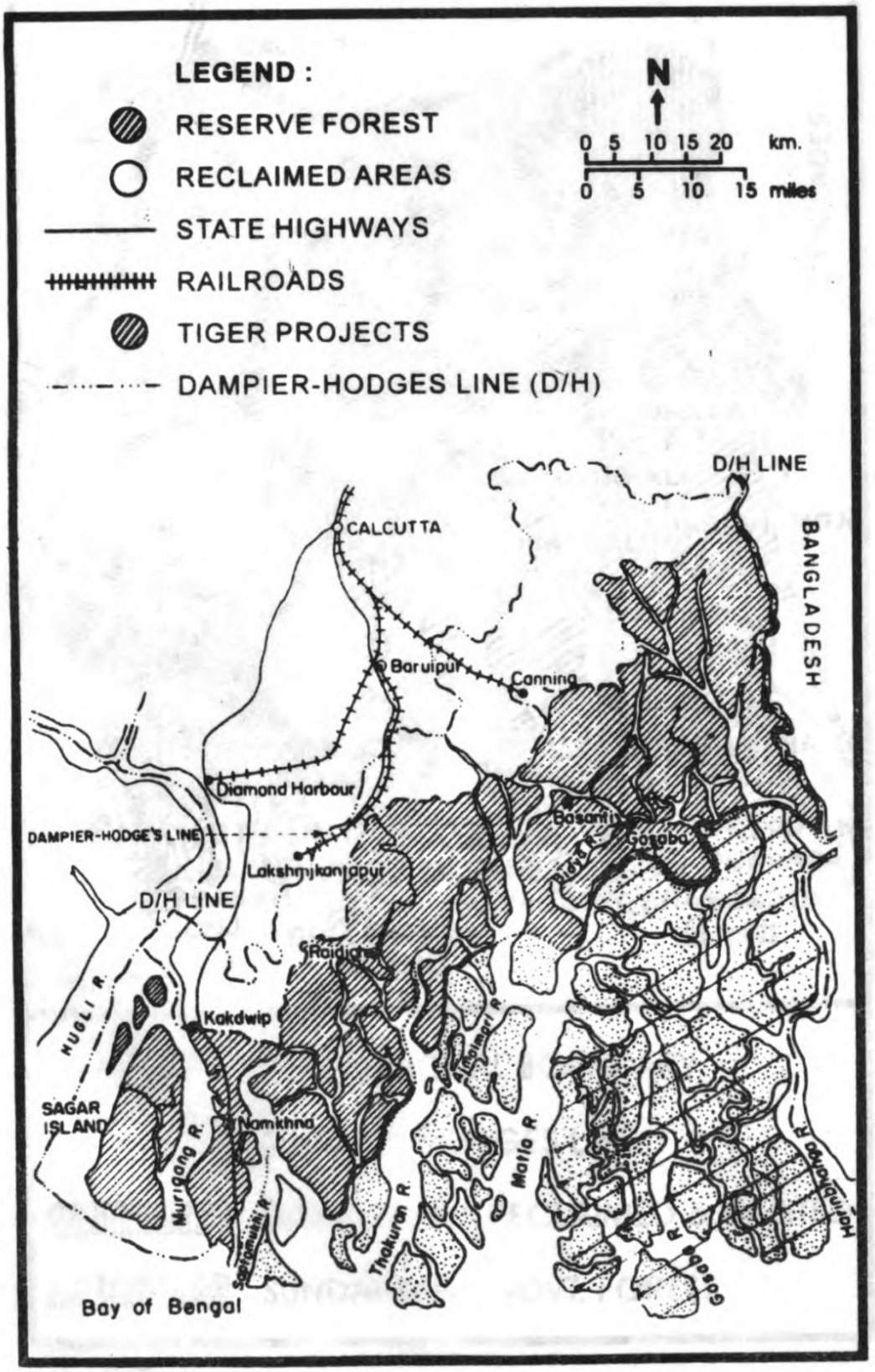

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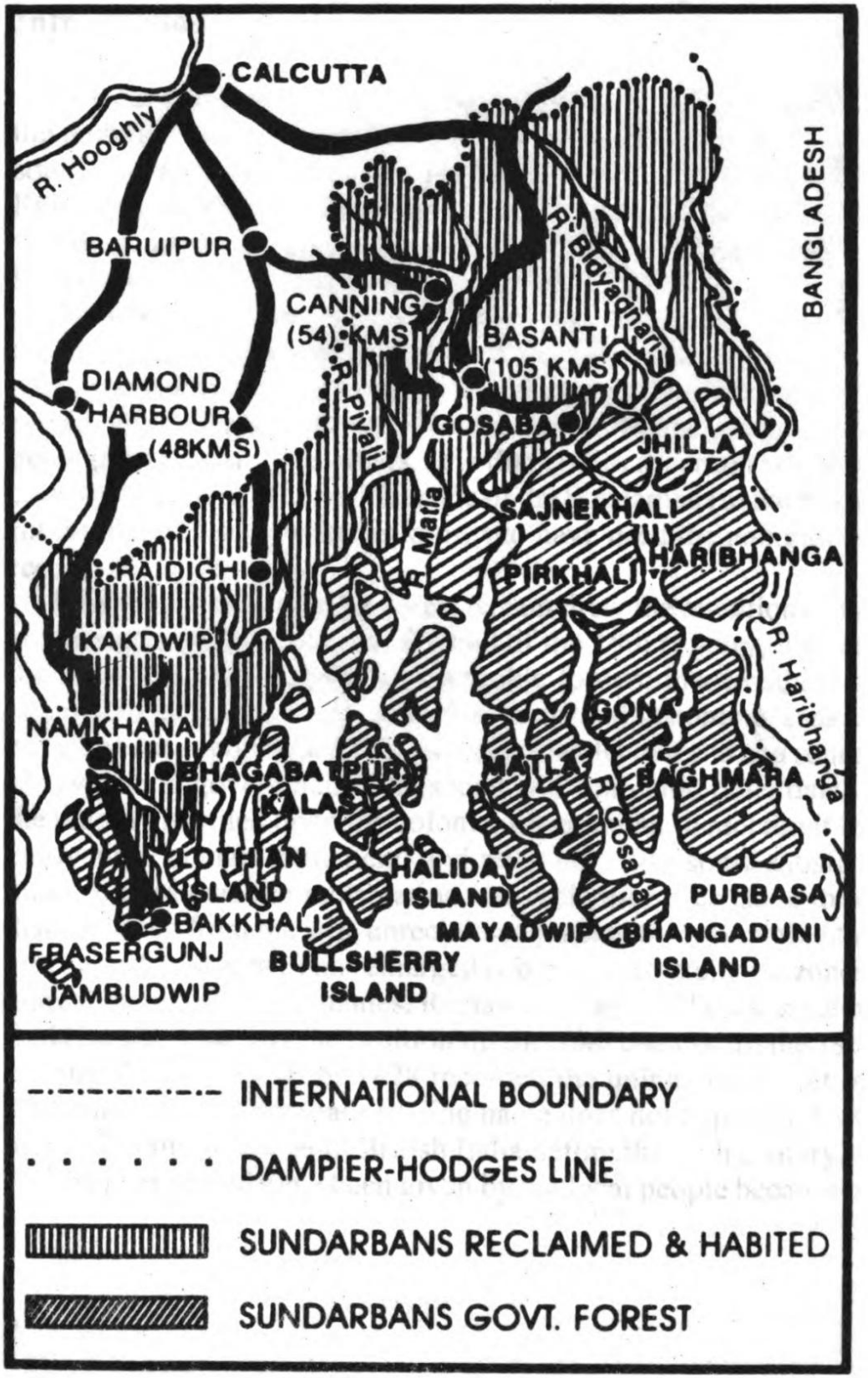

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CHAPTER-I

Introduction

The far-flung estuarine Ganga-Brahmaputra deltaic region of the undivided lower Bengal bordering on the Bay of Bengal on the south and stretching from the Padma-Meghna on the east to the Raimangal-Matla-Thakurani- Hooghly on the west so as to include within its geographical boundary the districts of Jessore-Khulna, Backarganj (now in Bangladesh) and the 24-Parganas (in West Bengal) has been popularly and traditionally known in the history of the deltaic Bengal under the name of the Sundarbans, though the name was not in use in any early official record. The area was simply called the deltaic region of lower Bengal by the geographers, geologists, tourists, and others. It is difficult to ascertain who first coined and applied the specific name of the Sundarbans to the frightful terrain. No early writer is known to have used the name in his record.

When the deltaic marshy forest terrain drew the attention of the colonial government towards the end of the 18th century, it found the region overgrown with impenetrable forests, inaccessible, inhospitable, and abounding in wild animals and venomous snakes, but viewed it as potential for farmland and settlement and as a source of revenue to government. The social and economic potentials of the region prevailed upon the colonial government to reclaim it for cultivation, human settlement, and revenue. After some satisfactory progress made in reclamation, the reclaimed area came to be distinguished from the still unreclaimed portion by designating the latter as a 'forest area'. Thus emerged two mutually exclusive zones, known by two different names, Reclaimed area and Forest zone or Bada jungle. This was the position till the 18th century. In the 19th century, Regulation III of 1828 recorded the uninhabited tract by the name of the Sundarbans.[1]. The name does not appear to have been officially in vogue in British India before the 19th century.

The name could have been given by the local people because of

the abundance of the Sundari tree (Heritiera Minor) in the forest. The word was also sometimes locally pronounced as Sundariban. Because of its sea-side location the forest might have been originally named Samudra-ban (Samudra or sea, ban or forest) which was later corrupted into Sundarban. To Pargiter, the second explanation appears to be more plausible. If the abundance of Sundari trees were the real origin of the name, he argues, similar forest areas south of Chittagong where Sundari trees either do not grow or are rare should not have been called Sundarban, whereas 'large forest tracts near the sea' are described, in Sanskrit literature, as Samudraban, simplified in popular usage as Sundarban. 'The second observation seems to me the more probable', writes Pargiter in his Revenue history of Sundarban, page 1, FN.1. According to W.W. Hunter (Statistical Account of Bengal, vol.I, 1875, p.379), 'the name Sundarban has been variously explained. The word has been derived from Sundar and ban, meaning a beautiful forest or it has been looked upon as a corruption of Sundarban or Sundari forest from Sundri, a well known timber tree which grows in vast quantities in the jungle. The reddish colour of its wood explains the name which although simply meaning beautiful is perhaps connected with sindur, vermillion, and the common belief is that the wood becomes redder the more its roots are reached by the salt water.' As Hunter further writes, others again have derived the word from Chandradwipban or Chandradwip forest, Chandradwip being the name of an old zamindari pargana. Hunter further explains that the name has been connected with the Chandabhandas, an old tribe who like the malangis of modern times were engaged in salt-manufacture. Their name first occurs in a copper plate Inscription of 1079 A.D., discovered at Idalpur or Adilpur in northern Backarganj (in Lot No. 55 of Hodges' map). As recorded in the Proceeding of Asiatic Society of Bengal, December, 1868, p. 270, a seminar was held on the Sundarbans in 1868 where one of the speakers, Pratap Chandra Ghosh, said: 'In the copper-plate Inscription Madhava Sen, evidently a brother to Kesava Sen of the Senarajas of Bengal, made a grant of some villages, Bogule (Bogla, according to Persian writers) etc. to a Brahman. Along with the villages, the King conferred on the recipient the right of punishing and employing the Chandabhandas, a tribe that inhabited the place. This tribe, I believe, gave the name to the uncultivated portion of the delta which they then occupied.'

Pratap Chandra Ghosh also did not rule out the probability of the origin of the name Sundarban from the Sundari forest. 'This appears probable as a whole district is named Hogla from the occurrence of a reed Typha Elephantina of the same name', he said (Ibid).

In continuation of his views on the origin of the name, Hunter writes further that 'the extension of the name of Sundarban to the whole coast is evidently modern. Muhamedan historians do not use the term but give the coast-strip from the Hughli to the Meghna the name of Bhati which signifies lowland overflowed by the tides. Even now-a-days the term is used in Jessore and Backarganj as the name of the Sundarban district and the inhabitants are called Bhatilok.' Throwing further light on the controversial issue of the origin of the name, Hunter writes : 'In the improved rent roll of Shah Suja, as Grant (Serestadar) informs us, a portion of the Sundarbans is called Murad-Khanah or Jerad-Khanah. Though it is not stated to which portion these names apply, there is little doubt that they refer to the Sundarbans in Backarganj. Grant translates the former name by the mansion of desire and adds that the latter implies that the district is visited by locusts (Jerad in Arabic means locusts) but these etymologies are doubtful.'

Some conjecture that the name in question owed its origin to the name Sundha, a river of Backarganj. Formerly, one side of Backarganj was known as river-side of the Sundha (Sundhar-Kul). The forest adjacent to the river-side was called Sundhar-ban corrupted into Sundarban. (Beverdge, History of Backarganj. Also, Behala Janapader Itihas by Sudhindra Nath Bandyopadhyaya, p.25). Dr. Nihar Ranjan Ray raised doubt about the origin of the name from Sundari tree and argued in favour of the name Chandraban as the origin of the name of Sundarban. In the course of his address at a conference (on the writing of history of the 24-Parganas in 1365 B.S.), he held that there were in vogue at least 27 names spelt with the word chandra on the shore area of the crescent-shaped sea. Such names foreigners could not spell correctly, with the result that the word Chandraban was mis-spelled as Chunderban, Schundreban. Finally, emerged the correctly spelled word Chandraban (Somprakash, 4th issue, 1365, p. 298).

Thus various are the theories, mostly conjectural, regarding the origin of the name of Sundarban. The popularly accepted theory, however, is that Sundarban was named after Sundri tree.

The colonial government took the credit of initiating and implementing the policy of reclamation and claimed to have marked the beginning of the history of the so-called forest-area for the first time. The obvious implication of such a claim by the colonial government is that before the reclamation the so-called forest area had known no human habitation, no agriculture, no traces of urban life or urban culture and civilization. But history belies such colonial pretensions. Explorations and, in some cases, scientific excavations have not only exposed the hollowness of the colonial claim but also established the truth that the so-called Sundarbans region, particularly the western portion, had a glorious past, even predating the Christian era, as would be evident from the Archaeological findings at different parts of the South 24-Parganas during the Maurya, Sunga, Gupta, and Pala periods of ancient Indian History. This aspect has been elucidated in Chapter II. The span of civilization, however, knew interruptions at intervals for some unknown reasons, may be for subsidence of the bed of the delta or the visitations of some natural calamities like floods and cyclones which buried underground the rural and urban centres with relics of art and culture, leaving nothing but signs of destruction all around. It did not take long for trees, bushes, and tall grasses again to cover the entire area which consequently came to present the look of an impenetrable forest. Years afterwords some other part of the region came to throb with life and developed centres of art and culture. Such an area again suffered destruction in the wake of the repetition of natural calamities, with the result that forests engulfed the centres of art and culture, as before. The process knew repetition several times in the history of the region–disappearance of civilization followed by its reappearance. Historians are, however, agreed that there were signs of unbroken urban and civilized life in the western part of the Sundarbans region from 5th-6th century AD till about 12th-13th century after which the western area concerned was completely deserted for some unknown causes. [2] Thereafter for several centuries (about 400-500 years), the abandoned region remained steeped in deep forests. The Mug and Portuguese ravages gave a quietus to the life in the eastern part of the Sundarbans by the 18th century. [3] Political or social causes, natural calamities causing subsidence, and the incursions of the Mugs and the Portuguese might have played their role well in causing destruction to

civilized life in the Sundarbans by the end of 18th century. The socio-economic and cultural history of the Sundarbans got a new lease of life under the official policy of reclamation. After the partition of India in 1947, the eastern portion of the Sundarbans was allotted to the then East Pakistan (now Bangladesh) while the Indian share included the western portion. The Indian portion is situated in the district of the 24-Parganas (south) in the Gangetic delta portion in West Bengal. It is with the Indian portion of the Sundarbans that the present study is concerned.

The Gangetic Delta was not obviously man-made. It was a freak of Nature, a gift of Nature. A 19th century statement [4] locates the delta '47 miles from the sea', the sea-front of the delta having then 'nine principal openings with a head stream flowing direct from the Ganges or from the Meghna or the Brahmaputra.'The statement refers also to numerous other openings having no head stream, such openings being more salt-water tidal estuaries. They are represented as 'the deepest as no silt or deposit is poured into them from the higher lands.'

Formation of the Delta

How and when was such a delta formed ? Away in the distant past which cannot be precisely determined the Gangetic delta resembling the Greek capital letter Δ was formed by the deposition of silts, clay particles, and various other ingredients carried down by the Ganga, the Brahmaputra and their tributaries over the centuries mainly from the Himalayas and to some extent from the Chhotanagpur and Rajmahal hills. The stones and red soil of the Chhotanagpur hills were found at a depth of 300 metres at the Sagar Island and at several other places in the western Sundarbans delta.[5] On the formation of the Gangetic delta the statement of Dr.T. Oldham is no different : ' I suppose no one will hesitate to acknowledge that the whole of the country (24-Parganas) including the Sundarbans proper lying between the Hooghly on the west and the Meghna on the east is the only delta caused by the deposition of the debris carried down by the rivers Ganges and Brahmaputra and their tributaries. [6] Elucidating this admitted principle behind the delta-formation, Dr. Oldham further states that streams 'constantly' change their courses, eroding one bank and forming the other until the chan-

nel in which they formerly flowed gets choked up and the water is compelled to seek another course. Every stream or river, large or small, flowing through a flat tends to raise its own bed or channel by the deposition of silt and sand it holds suspended in its waters, and by this gradual deposition the channel-bed is raised above the actual level of the adjoining flat. This process, as Dr. Oldham seems to suggest, leads to the formation of solid landmass forming part of the deltaic region.

Waves rolled and centuries passed since the formation of the Gangetic delta or the traditionally called Sundarbans delta bordering on the Bay of Bengal. The delta had a chequered history marked by the ups and downs of fortune till by the 12th or 13th century natural calamities left it a deserted region in which state it continued for about 400-500 years as written earlier. This long gap saw the Sundarbans region overgrown with impenetrable forests and haunted by ferocious wild animals. The region came to present a frightful look. Then came the reclamation phase. A new era dawned in the history of the Sundarbans. With the passage of time the region emerged as a conglomeration of a large number of islands separated by so many waterways, agriculture-based rural areas, urban centres, Block areas, and police-stations. The region developd as a peculiar terrain where the man-eating Royal Bengal tigers lived as the jealous neighbours of the man-eating ferocious crocodiles, poisonous snakes, sharks, lizards, birds, porpoises, honey-bees, crabs, snails, and innumerable vertebrate and invertebrate species. The terrain demonstrated the co-existence of man with wild life and the harmony between man and nature. Both the fury and beauty of the area attracted the attention of tourists, ecologists, environmentalists, zoologists, proto-zoologists, and marine biologists.The curious and anomalous nature of the tract did not escape the attention even of the western scholars of the 19th century. A pen-picture of the region, given below by one such scholar, may be of some interest here: (7) ' Whether we look at it (Sundarbans) as a tract of a country of the most beautiful aspect but at the same time most fatally pestilential, we must still view it as a curious and anomalous tract, for here we see a surface soil composed of black liquid mud, supporting the huge rhinocerous, the sharp-hoofed hog, the mud-hating tiger, the delicate and fastidiously clean-spotted deer, and nourishing and upholding large timber trees. We see fishes climb-

ing trees; tides running in two directions in the same creek and at the same moment; we see wild hog and tigers–animals generally hating water -swimming across the broadest rivers as if for amusement. In one creek a dead calm, and in the next, a raging sea. In some creeks the abundance of insect-life over-powering, in others close by not a living creature is to be seen. Some creeks are deadly to sleep in, others are perfectly free from miasma . Some are dry at low water, in others and in those contiguous, no bottom can be found at ten fathoms. In one, all is fog and doubt, in the next, all is in brightest sunshine; and many other anomalies present themselves, all rendering the Sundarbans spot of much interest, offering, as they do, so many subjects of investigation and research. Most travellers in passing through the labyrinth of interminable forest, mud, and water became exceedingly wearied with the monotonous appearance of tidal banks of rivers and creeks and are only glad when they escape into the open and cultivated northern parts of the delta where all the breadth of the land is one vast sheet of rice cultivation.'

Situated a little south of the Tropic of Cancer between 20° 32' and 22° 40' latitude north and between 88° 05' and 89° 00' longitude east, the labyrinth of the Sundarbans which fell to the share of India since 1947 started its career with an area, under the control of the 24-Parganas Forest Division, of 1,630 sq. miles included in 5,639 sq. miles being the area of the entire district of the 24-Parganas.The area strictly under forest was recorded as 303.4 sq. miles.[8]

The Sundarbans region is at present demarcated on the north by the Dampier-Hodges line, on the south by the Bay of Bengal, on the west by the Hooghly, and on the east by the Ichhamati-Kalindi-Raimangal rivers.[9] In their respective capacities as the Commissioner and Surveyor, William Dampier and Lt.(Capt.) Hodges demarcated the forest area from the rest of the 24-Parganas as early as 1831 by means of a line known after them, running a slightly zig-zag course from near Basirhat in the north-east to the Hooghly near Kulpi on the south-east.[10] The line has ever since indicated the northern boundary of the forest area which constitutes the south-western part of the 24-Parganas.

Formerly the forest area was more extensive than its present boundary, as indicated above. It then extended further so as to include Calcutta and its environs—Behala, Sarsuna and Barisha. 'In Clive's day, it (Calcutta)', writes Dr.S.C.Ghosh, 'was still

surrounded by undrained swamps, swarming with mosquitoes and with Sundarban jungle infected with alligators, wild boars, and tigers.' [11] The inclusion of the Calcutta area within the then boundary of the Sundarbans is evidenced by the discovery of stumps of some Sundari trees 30 feet underground near Sealdah.[12] Keoratala Ghat, one of the largest cremation grounds in Calcutta, derived its name from the soft-wooded Keora tree, a species of the Sundarban forest,which was much in demand in Calcutta market for burning dead bodies.[13] Remains of Keora tree were found underground at the site in the course of digging. Esplanade, Fort William, and Chowringhee areas of today's Calcutta were covered with jungle as early as 1756. There was no land available for cultivation for seven miles at a stretch towards the east though Behala, Barisha, and Sarsuna were then inhabited and cultivable areas. The area west of Park Street of today, the area from Bhawanipur to Kalighat and Alipur were covered with forest. [14] All such forest-covered areas could be regarded as parts of the old Sundarbans. Today Calcutta or greater Calcutta including Behala Janapada is no longer included within the boundary of the Sundarbans region which has now a well-defined demarcation.

With the boundary issue is linked that of the coast of Bay of Bengal (southern boundary) which is 80 km long. The coast is almost equally divided into east (Sundarban) and west (Midnapur coastal plain) by the north-south alignment of the Hooghly (Ganga) in the lower Bengal Basin. [15] The west coast provides resources of livelihood to the people of South Bengal. In the Sundarbans is situated the main wetland region of West Bengal. Deltaic islands, estuaries, and coastal lowlands are the typical features of the coast of West Bengal.[16] The coastal area comprises monotonously flat plains of extensive fluvio-marine deposits of the Ganga. Exceptions in this regard are supplied by complex dune-ridges and mudflats on the isolated islands of the south-western Sundarbans. 'Dunes are the product of sea-deposition on the coast in which wave and wind processes play a dominant role in the formation of dunes. The dune landscape in the Sundarbans comprises a system of low ridges parallel to the coast, separated by large, dry, and wet sandflats.' [17] The main function of the coastal dunes relates to the protection of the hinterland, water-storage, and biotic resources. Dunes like a camel's back [17a] are growing on several islands of the Sundarbans

at present with the sufficient supply of sands on the shores.[18] Dune-formation in the Sundarbans is determined by the following ' four major factors: sufficient source of sand on the beach; presence of long, dry season with strong wind-speed (20 to 50 km per hour) on the shore; high sub-surface moisture; rapid growth of vegetation on the sandy shore.' [19] Indeed, the morphology and ecology of the sand-dunes and mangrove swamps are largely controlled by the occurrence of vegetation.

No less important role is played by the Mudflats.'Mudflats are found at the estuaries and on the deltaic islands of the Sundarbans where the sheltered spots are marked by low velocity of river and tidal currents. Suspended sediments of finer quality get time to settle down in the sheltered areas where the disturbances of tidal currents and waves are minimized and thus the mudflats are developed on the islands and estuarine banks. The thick mud substratum is richer in organic content and is ideal for penetration by plant roots. The extended mudflats of estuarine environment are important feeding grounds for marsh and estuarine birds, and mudflats are magnificient home of mangrove flora and fauna... The mudflats of the Sundarbans are especially vegetated by mangroves. The species-replacement of mangroves is a peculiar characteristic of the mudflats by which one species develops on a mudflat and makes way for another.The intricate branching root systems of the mangroves accelerate siltation on the mudflats and new islands are developed.' [20]

A noteworthy peculiarity of the geography of the Sundarbans is that it is traversed by innumerable waterways — rivers, creeks, estuaries and khals — collectively creating the communication problem of the islands of the region. The most important river in the area is the Hooghly which is the lower reach of the Bhagirathi, once the main channel of the Ganga. From Nabadwip downwards the Bhagirathi takes the name of the Hooghly. Before the earthquake of 1897, the Bhagirathi flowed through the Sundarbans with so many branches which disappeared in the wake of the quake. The Hooghly and Ichhamati besides, other waterways are the Kalindi, Raimangal, Gosaba, Vidyadhari, Harobhanga, Vidya, Matla,Thakuran, and Soptamukhi, reckoned as estuaries. Except the Hooghly and Ichhamati, other rivers have no connection with the head-water channels of the upland rivers. The rivers of the Sundarbans are, therefore, tidal in feature. Free tidal flushing of the spill areas being

interrupted by the premature reclamation of land and by the construction of embankments, large volumes of sediments which such rivers carry do not raise the level of the delta but elevate only the river-beds, aggravating the drainage problems of the islands.

The Mahabharata mentions five hundred rivers flowing through the united Sundarbans region of the days of yore and refers to the Ganga as 'Satamukhi Ganga.'[21] The Bhagirathi in the name of Adi Ganga flowed through the heart of the 24-Parganas past Kalighat, Garia, Rajpur, Baruipur, Mathurapur, and Chhatrabhog and finally joined the Bay of Bengal. The Adi Ganga was the main stream of the Ganga and also the highway for the sea-borne trade of the prosperous Ganges valley of the south 24-Parganas. Pre-history refers to the voyages of merchants like Srimanta, Chand Saudagar along the route of the Adi Ganga. Mahaprabhu Sri Gauranga made a pilgrimage to Nilachal along the route of the Adi Ganga via Dwarer Jangal.[22] The Adi Ganga began to dry up in the 16th century.

The Padma and Meghna carry more volumes of sweet water than the Hooghly and Bhagirathi. The rivers of the Bangladesh Sundarbans, being directly connected with the Ganga bring down enormous volumes of fresh water, specially from the rains. Their streams are thus less saline than those of the rivers of Indian or western Sundarbans. The western Sundarban rivers, on the other hand, are not, in any instance, immediate distributaries of the Ganga. They more resemble the long arms of the sea than the rivers. Being subject to tidal influence throughout their course, the waters they carry are consequently more saline than the waters of the eastern Sundarban rivers.The effect of all this is reflected in the character of the vegetation of the two regions. In the cultivation of crops and in the growth of plants the Indian Sundarbans lag behind Bangladesh counterpart.

Most of the waterways in the Indian part of the Sundarbans being estuarine or arms of the Bay of Bengal, salinity of water is unavoidable. On an average, the surface area may be divided into low salinity from up to 8 PPT and moderate-to-high salinity from 8 PPT to 20 PPT. Low salinity period generally stretches from April to October, moderate salinity from November to February, and high salinity from March to June.[23]

Salinity has been detrimental to the availability of both surface water and ground water for human consumption and cultivation. In

a country of so many waterways, drinkable water is not easily available. What can be more anomalous and tragic than this? Our sentiments find an echo in the lines Coleridge wrote in his The Ancient Mariner :

'Water, water, everywhere,
And all the boards did shrink;
Water, water, everywhere,
Nor any drop to drink.'

On water-supply S. J. Curtis, a former Deputy Conservator of Forests wrote about 1933. [24] 'Through the Sundarbans the supply of drinking water is a very difficult problem. Many tanks have been dug but many of them are failures and they contain salt-water instead of fresh water. Towards the end of the dry season there is generally a fresh-water scarcity in the villages surrounding the forests, and the villagers frequently have to be content with either dirty or slightly saline drinking water. During recent years several tube wells have been sunk in various places of the Khulna and 24-Parganas districts. In the Mufassils of the 24-Parganas district, fewer wells have been dug but the borings are much deeper and, though more expensive, they are all successful. Fresh water wells have been sunk at Kakdwip and Sandeshkhali.'

Rai Saheb Anil Chandra Lahiri's (former Deputy Collector and Assistant Settlement Officer, 24-Parganas) observations on the scarcity of drinking water in the Sundarbans are also cited below. [25]

'Although the Deltaic region is surrounded and intersected by innumerable channels and tidal rivers, the inhabitants suffer badly for want of a tank of drinking water which in year of scanty rainfall becomes serious. For drinking and culinary purposes they have to depend on rain water preserved in the few ditches which are apologies for tanks. During summer when the water of these tanks becomes dried up or useless, the people obtain their supply of drinking water by boats and carts from the neighbouring more advanced areas. At times womenfolk carry their pitchers by relays to fetch water from a fresh-water tank which is often situated at a distance of 10 or 12 miles. In the Sagar Island, the condition of the people is better than in the mainland as the lessees have been compelled to maintain large protective tanks according to specific dimensions on pain of resumption of their lease. In the areas under colonization, Government have adequately provided for drinking water.'

Dr. Manindra Nath Jana in his 'Sundarban Bichinta'. vol.I, published in 1977, writes about the indescribable sufferings of the tribals for the non-availability of potable water even ten or twelve years after India's independence. Often they collect drinking water from a few drinking water-tanks at a distance of two or three miles from their villages. Towards the end of the 19th century the Sundarban people, Dr. Jana informs, used to take sea-water mixing it with tamarind. At times, drinking water was brought from Midnapur in big jars by boats and distributed among the local people once or twice a week.

The problem of the supply of drinking water to the people of the Sundarbans still persists, and their consequent sufferings also continue, as would be borne out by the Report (1991-92) of the Sundarban Development Board: 'Surface water of the region is saline and unsuitable for human consumption and agricultural use. Ground water is available at a depth of 300 to 400 metres.'

In a region like the Sundarbans where the water for irrigation is saline, agriculture cannot expectedly thrive though about 89 p.c. of the local population of the region is dependent on agriculture as against 57 p.c. of the State. Among the agricultural workers, the poverty level can be guessed from the high percentage of landless agricultural labourers. They constitute 50 p.c. of the cultivators. The numerical strength of such landless cultivators is known to be on the increase. Agricultural economy has been discussed at some length in chapter IV that follows.

Although the region is situated south of the Tropic of Cancer, the temperature is equable but due to proximity to sea a heavy rainfall occurs and a humid climate prevails. Temperature changes from 20°C in December–January to 28°C in June–July. The annual average rainfall is around 1963 mm.(70 inches). 90 p.c. of the annual rainfall occurs during May and October. Climate is suitable for year-round cropping. The people are hard-working and can produce bumper crops if adequate facilities for cultivation be given them. The alluvial soil of the region, if protected and treated adequately, is capable of bumper production. Arable lands require proper protection against the ingress of salt water by the construction of durable embankments which are looked upon as the life-line of the Sundarbans, also as the last-line of defence. Wide sandy beaches are the first-line of defence while parallel sand-dunes in the

backshore areas represent the second line. Beach protects sand-dunes, and sand-dunes protect earthen embankments. Lotdars and beldars (special guards) keep watch over embankments and are expected to initiate repairs to threatened breaches. There were, by 1986, about 3,500 km length of earthen embankments in the Sundarbans constructed to protect the reclaimed areas. (vide Dr. Baroda Charan Sarma's thesis entitled 'Impact of fisheries on the development of Lower Sundarban Delta). According to the Report of the Fact Finding Committee (1984), the total expenditure during the period from 1978-79 to 1982-83 for the construction and maintenance of embankments amounted to Rs. 1,117·86 lakhs. Embankments claim more attention from the government.

No less attention is claimed by the communication system of the Sundarbans. The Report of the Sundarban Development Committee, 1950, states: 'As is to be expected in an area so closely intersected by waterways, roads are scarce and very poorly maintained. There are 80 miles of unmetalled roads under the management of the District Board, the more important of them being the roads between Nischintapur and Kakdwip, between Kakdwip and Namkhana, Muriganga and Sagar Mela ground, and between Hasnabad and Hingulganj. The marginal embankments and 'crossbandhs' serve the purpose of fair-weather roads for pedestrians. A metalled road from Diamond Harbour to Kakdwip is under construction. Most of the traffic is by boats of which, according to one estimate, there are about 2,000 in the area, there having been a reduction in the number since the war. The shortage of boats has been still persisting. The eastern part of the area is now served by a limited number of motor launch services started recently by private enterprise. Very few are also the number of Bhat-Bhati or boats propelled by diesel oil. Of the 4 Railroads which serve the area, namely Barasat-Basirhat Light Railway and the 3 branches of the East Indian Railway terminating at Diamond Harbour, Lakshmikantapur and Canning, only the last named just enters the limits of the Sundarbans proper. Postal and telegraph facilities are extremely meagre.'Communication during the rainy season becomes extremely difficult. Then the local producers fail to carry their goods to markets for sale, children can not attend schools, patients remain without medical help, even ailing domesticated animals have to suffer in silence. Commenting on the communication facilities as at present, the Administrative

Report (1991-92) of the Sundarban Development Board states: 'The communication facilities and other amenities are inadequate and undeveloped. Consequently, access to many areas is difficult and, in the rainy season, some areas are cut off. Inaccessibility is the main constraint to development of the region. The metalled road-length of the region is about 280 km while the railway track is negligible at 42 km.'

The people who inhabit such a region are mostly Hindus of backward classes or Scheduled castes and Scheduled tribes.There are besides a percentage of upper-class Hindus, Muslims of Sunni Sect, Christians, and Buddhists. The population of the Sundarbans also includes Hindu emigrants from the then East Pakistan who came over to India in the wake of the partition of India in 1947 and the Bangladesh liberation struggle in 1971 to settle here permanently. They sought refuge in India and consequently created the refugee problem which still remains unresolved. In all, 946 families from East Pakistan (Khulna, Barisal, Faridpur, Jessore) crossed into India between 1948 and 1960 and were rehabilitated at the Jharkhali-Laskarpur area under Basanti Police Station in 1960-61. [26] The area is bounded by three rivers-the Vidya on the east, the Matla on the west, and Harobhanga on the south. The object of our government was to get the land of the area reclaimed by the new settlers for agricultural purpose. The growth of agro-economy in such uneconomic region was expected by government to help rather than retard the growing economy of West Bengal in particular and of India in a wider perspective.Government accordingly took care to allot land in the area to such migrant families as had their former residence by sea-side and had the experience of farming in the salty land. Such allottees were each given a 3-acre cultivable land with a 10-cottah plot adjacent to it for homestead. Cultivation was the single largest occupation of the migrant families. Cultivation besides, they followed other occupations as well such as fishing , petty business, service, teaching etc. They belonged to various castes–Scheduled, Paramanik, Brahman, Kayastha, Mahishya, Jogi and others.[27]

Migration into the Sundarbans may be traced back even to the 19th century. As recorded in General Administration Report, 1874-75, for instance, persons from Bankura, Birbhum Chhotanagpur, Hazaribagh, and Manbhum immigrated into the Sundarbans (then United Sundarbans) area to settle on the newly cleared lots

there.[28] The immigration of labourers for the cultivation of new lands in the Sundarbans continued in 1875-76 much the same as before. In 1876-77, a large number of people from different parts of Bengal, even from the British Burma annually visited the Sundarbans for fishing, collecting forest produce, cutting wood, and reaping paddy. In 1879-80, there was the usual temporary in-flow of coolies and corn-reapers into the Sundarbans from the 24-Parganas, Nadia, Jessore. They left their home-districts in search of employment during the sowing and reaping seasons and returned home after the seasons had been over. During the same period, about 3,000.[29] Oriyas and others from Balasore and Midnapur moved into the Diamond Harbour Subdivision during the harvesting season and returned home after the crops had been harvested. The temporary movement of Labourers from the districts of the 24-Parganas, Nadia, and Jessore into the Sundarbans continued as before. [30] The year 1880-81 witnessed the migration into Diamond Harbour of about 4,500 Oriyas [31] and others from Balasore and Midnapur during the harvesting season. In 1882-83 also, there was, as usual, the temporary in-flow of laboures into the Sundarbans from North 24-Parganas, Nadia, and Jessore. In fact, in large rice-producing areas like Diamond Harbour, Canning, Jaynagar, labour from outside areas was annually required to assist in cutting crops.

In this connection, the tables presented below show the distribution of Sundarbans' total population, Police-Station wise, after the partition of 1947, which may be of some interest here :

Police Station	1951– 8 P.S. [32]
Jaynagar	1,96,047
Canning	1,88,216
Haroa	1,02,374
Hasnabad	1,45,436
Sandeshkhali	1,76,266
Mathurapur	2,02,100
Kakdwip	97,819
Sagar	51,463

Police Station	1961 [33] 17– P.S.	1971 [33A] 17– P.S.	1981 [34] 17– P.S.	1991 [35] 12 – P.S.
Canning	1,45,503	1,94,751	2,48,754	3,14,026
Basanti	96,369	1,36,043	1,72,353	2,26,974
Jaynagar	1,75,231	2,16,761	2,54,478	3,17,631

Kultali	81,248	1,19,809	1,47,147	2, 01,425
Kulpi	1,19,859	1,46,144	1,67,640	2, 11,651
Mandirbazar	85,471	1,08,123	1,26,947	1, 59,855
Mathurapur	1,61,616	2,08,426	2,44,609	1, 41,888
Patharpratima	1,13,089	1,60,493	1,97,636	2, 45,601
Kakdwip	97,427	1,27,701	1,66,777	2, 27,692
Sagar	73,629	91,229	1, 15,228	1, 54,202
Namkhana	41,609	56,678	74,156	96,750
Haroa	83,836	1,01,749	1,34,143	—
Minakhan	49,255	63,367	76,564	—
Hasnabad	1,17,307	1,42,483	1,59,265	—
Sandeshkhali	1,24,209	1,61,344	1,91,076	—
Hingulganj	68,331	81,419	1,04,799	—
Gosaba	1,03,443	1,40,844	1,68,335	2, 00,514

The total population of the Sundarbans region, according to 1991 census, is about 2·5 million (24,55,370).

Discussion on forests and denizens of forests occupy a considerable place in a dissertation on the Sundarbans. The Sundarban forests were originally composed of non-Mangroves (Paras, Nona Jhaw, Siris, Jhaw, Babla, for instance), Mangroves, and Mangrove Associates. Today the entire forestry is within the mangrove ecosystem.

The Sundarban forests in the Ganges-Brahmaputra Delta falling within the jurisdiction of India and Bangladesh are contiguous and comprise a single patch of estuarine forest. It is, indeed, the largest single of estuarine forest in the world, though intersected by countless waterways — rivers, creeks, and khals. The estuarine forests are composed of halophytic plants that grow on swampy, clayey, muddy, and saline substratum. Reclamation in favour of Farm Land and Settlement has led to a considerable reduction of the forests area of the Sundarbans. If, by 1909, [36] the Indian portion of the Sundarbans comprised an area of 2,941 sq miles or 7,352 sq km, the area today stands reduced to only 4,264 sq km, which accommodate the National Park (the Tiger Reserve), three sanctuaries of Sajnekhali, Lothean and Haliday and Buffer area. Further details about the forest area are supplied in the chapter on the Sundarban Biosphere Reserve. The Plants that grow in the Sundarbans forest belong to the Mangrove species and include, to mention a few, Sundari, Keora, Garjan, Khalsi, Baen, Goran, Genwa, Keya, Passur,

Golpata, Hental. More details are supplied in the chapter on Mangroves.The most noted species of the wild life of the region include the Royal Bengal Tiger, spotted deer, wild boar, crocodile, and king cobra. Among the varieties of fish found are Hilsa, Bhetki, Prawn and Parse. Crabs are also there. The birds include kingfisher, open-billed stork, egret eagle, hawk, vulture and many others. Above all, there are the Honey bees(Apis Dorsata), a great source of revenue to government.

The lower Gangetic Deltaic region bordering on the Bay of Bengal experienced subsidence on several occasions in the course of its long history prior to the implementation of the project of reclamation, of which evidences are not lacking. The soil of the region is composed of alluvium which renders it reasonable to believe that there might have been some subsidence of the deltaic area in the past.

Here is the considered opinion of Col. J. E. Gastrell, former Deputy Surveyor-General and Superintendent of Revenue Survey, Upper Circle, about the likelihood of subsidence taking place: 'That a general subsidence has operated over the whole extent of the Sundarbans, if not of the entire delta, is, I think, quite clear from the result of examination of cutting or sections made in various parts where tanks were being excavated.' [37] The side-cutting of a tank situated about 12 miles north of the nearest Sundarban lot or about one mile to the west of the steamer coaling-station at Khulna, Gastrell illustrates, exposed an old forest consisting entirely of Sundari trees at a depth of 18 feet below the surface ground. The Sundri trees brought to light were of various sizes, with their roots and the lower portion of the trunks exactly as they must have existed in former days when all was fresh and green above them. Gastrell further mentions the discovery of the stools of Sundri trees at Sealdah at various levels, at least as far down 30 feet from the surface. Kalidas Dutt, the late noted archaeologist of Bengal, has instanced some cases of subsidence from his different sources of information. [38] In the course of excavating a tank at Canning at the head of the Matla, for example, 40 Sundri trees were found standing inside the tank, no portion of their stems appearing above ground. (Calcutta review, 1859, 'The Gangetic Delta,' by Major Sherwell). The Sundri trees besides, coarse gravels were found at a depth of 420 feet at different places of the Sundarbans delta. It may

be, according to the geologists, small rocky hills existed in the area in the distant past, which subsided under ground consequent on a natural calamity (vide Oldham, Manual of Geography of India). Again, on the east coast of Raidighi Gong which flows west of Lot No.26, Kankandighi, remains of a very old locality were found buried under 7 or 8 feet under ground. From the size and quality of bricks found there it is presumed that the ruins relate to the Gupta Age. The Sagar Island furnishes many proofs of ancient human settlements buried under water in different periods of its past history. A few years before his death Mr. Guru Saday Dutt (G.S. Dutt) discovered two-mile long ruins of a city on the sea-coast on the Sagar Island and unearthed very rare antiquities of historic and pre-historic times, now under the inspection of the Archaeological Department. (Modern Review 1940-G.S.Dutt and the Indigenous Arts of Bengal). The hermitage originally built as 'Kapil Munir Ashram' on the Sagar Island received a watery burial at the Bay of Bengal as a result of the Earthquake of 1897. Thereafter, another ashram was constructed on the north of the previous one. There are, besides the above, other cases of subsidence which are too many to be cited here.The cases referred to above suffice to substantiate the fact of the occurrence of subsidence in the Sundarbans area in the past. With subsidence disappeared under ground many relics of art and culture from the areas affected, a tragedy in the story of human civilization.

But what led to subsidence ? One view is that the cause of subsidence was the unsubstantial nature of the Sundarbans foundation composed of a bed of semi-fluid mud, 40 feet in thickness.Terrific convulsions at different periods shook the delta to its deepest foundations, and the liquid mass unable to support the superincumbent weight repeatedly bulged out seaward, submerging the forests together with their flora and fauna. Gastrell, however, holds a different view: 'The general depression may have been caused partially by the continually increasing weight of the superincumbent earth and forest. It is more probable that it was caused suddenly during some great earthquakes'. (39)

Whatever causes might have led to subsidence, the fact remains that occasional occurrences of subsidence in alliance with the visitation of some natural calamities like cyclones and floods (40) and the scarcity of drinkable sweet water conspired to put out the lamp

of culture and civilization and to compel the people to desert the western part of the Sundarbans by the 13th century till at last life and settlement returned in the wake of the colonial policy of reclamation from the latter part of the 18th century.

Life in the eastern part of the Sundarbans succumbed, by the 18th century, to occasional deluges, cyclones, want of drinkable water, to the Portuguese piracy, and Mug incursions in the 16th century. On the Portuguese oppression Bernier (1655) writes.[41] 'They made women slaves, great and small, with strange cruelty and burnt all they could not carry away. And hence, it is that there are seen in the mouths of the Ganges so many fine cities quite deserted.'The Mug and Portuguese pirates entered, so to say, into an unholy alliance to bring ruin and spell disaster to the eastern Sundarbans area. Rennell in his Atlas of Bengal, Sheet No. XX, 1761, marked the entire southern part of the Backarganj district as a country depopulated by the Mugs. [42] The Mugs and the Portuguese during the first half of the 17th century swept the whole of the Sundarbans region clean of human habitations. Again, human settlements cannot grow where drinkable water is not easily available. The want of drinkable water left the Sundarbans quite deserted . As Dr. Thomas Oldham writes: 'The traveller may go for days or weeks, through the countless anastomosing creeks and channels of the Sundarbans without finding a single abode, whereas the moment he reaches any spot where fresh water is obtainable, he finds cultivations spreading and population increasing.'[43]

The eastern Sundarbans thus came to be deserted in the 18th century (by 1737). As in the case of its western counterpoint, life and settlement began to return to the eastern region in the wake of the implemention of the colonial policy of reclamation by the end of the 18th century.

APPENDIX

A list of natural calamities

1585	Deluge at the Sarkar Bakla (Backarganj), drowning 2,00,000 people during Akbar's reign.
1680	A cyclone swept over Sagar Island, carrying away more than 60,000 people.
1737	The year's storm-wave (deluge) helped in the process of the destruction of the Sundarbans population. The Sundarbans were deserted. Golgata (Calcutta) suffered badly.
1833, 1842, 1848, 1864, 1867	Severe cyclones and tidal waves swept over Sagar Island, causing a great loss of human life and cattle. One of the main reasons for such destruction was the exposed position of the Island and the absence of a sufficiently large protective belt of forests. After the storm of 1867 further serious loss of life was prevented by the construction of large freshwater tanks with embankments 16½ feet in height which provided shelter for men and cattle during subsequent stormwaves. (vide Government of Bengal Working Plan for the the forests of Sundarbans for the period from 1.4.1931 to 31. 3. 1951. vol.1,S. J. Curtis, Deputy Conservator of Forests, p. 45) .
1869, 1872	These two years also saw the outbreak of two stormwaves. The cyclone of 16 May 1869 destroyed 250 lives near Morrelgunj alone and the loss it caused to property was some thing immense. 'One wonders how in some of these storms the whole country is not at once swept bare, for there is no shelter from the storm and little obstruction to the swelling waters. Liability to cyclones must put a practical limit to the extension of cultivation: for the nearer one gets to the sea the greater the danger; and the more the forest is cleared, the smaller barrier placed between the cultivator and the sea. 'J. Westland (Magistrate and Collector of Jessore)– A report on the district of Jessore (1874 2nd ed.), p.183.
1909 (17 & 18 October) and 1919 (24 Sept.)	These storms were of much longer duration than the ordinary nor'-wester and much more severe, being accompanied by tidal waves, causing much loss of life and damage to houses, crops, cattle, and to forests as well. (vide Govern ment of Bengal Working Plan- S.J. Curtis, ibid, p.12).

Report of the fact-finding Committee (1984) of the Government of West Bengal presents the following list of storms that swept over the 24-Parganas during 1932-1970 : 1932(24 May), 1935 (8 July); 1936 (27 May); 1937 (28 September), 1940 (30 June, 7 July, 2 August, 21 October), 1941 (17 August), 1942 (9 July), 1948 (25 June), 1956 (30 May), 1960 (28 May), 1962 (21 September), 1970 (23 October). The storms of 1932, 1935, 1936, 1937, 1940 (30 June, 7 July), 1970 were severe.

The Census of 1951, West Bengal, District Handbook, 24-Parganas (page Lxviii), furnishes the following list of natural calamities:

1582 – Cyclone
1737 – Do
1770 – Famine
1823 – Flood, Cyclone
1838 – Flood
1858 – Do
1864 – Flood, Cyclone
1865 – Famine from October
1866 – Famine up to December
1867 – Cyclone
1868 – Flood
1871 – Do
1897 – Earthquake
1900 – Flood
1904 – Flood
1907 – Flood
1909 – Cyclone
1911 – Flood
1913 – Flood
1922 – Flood
1923 – Flood
1934 – Earthquake
1935 – Flood
1939 – Flood
1941 – Flood
1943 – Famine

16 May 1995 saw the latest calamity as a result of high tide and persistent rains – 20,000 people of the Sundarbans were rendered homeless following a breach at eight places in the embankments near the Police Stations of Patharpratima, Gosaba, Basanti, Napitkhali, and Birinkchikhali. (The Statesman, dated 16. 5. 95 p.1.)

References

1. L. S. S. Omalley, Bengal District Gazetteer, 1914, p. 180, vide also chapter - III .
2. Nihar Ranjan Ray - Banglar Nad-Nadi p. 35 – Also Som Prakash – Second year, first issue, 1365, Asoke Chatterjee p. 5.
3. Proceedings of the Asiatic Society of Bengal, Dec. 1868, p. 268 – In 1737 the Sundarban was deserted.
4. Vide Calcutta Review, March 1859, pages 1–25.
5. Naskar and Bakshi, Mangrove Swamps at Sundarban, p.27.
6. Proceedings of the Asiatic Society of Bengal for 1870, vide Census 1951, West Bengal, Land and Land Revenue Dept., p. 119.
7. Calcutta Review, vol. XXXII, January–June, 1859, pages 1–25.
8. The figures quoted are according to the Director of Land Records and Surveys, West Bengal, vide Census of 1951, West Bengal District Handbook of 24-Parganas, p. IV, LV.
9. Vide annual Administration Report 1981-82 to 1991-92 , Sundarban Development Board. Henceforth referred to as Report SDB.
10. Same as FN No. 8, The survey of the northern limits of the forest area was started by Ensign Prinsep as early as 1822. According to the Govt. of West Bengal Fact-finding Committee Report (1984) by Dr. T. K. Ghosh, the Dampir Hodges line runs from Kulpi on the Hooghly to Haroa on the Kultigunj and Hasnabad on the Ichhamoti.
11. Vide, Author's Salt Lake, p. 7.
12. Nakur Chandra Mitra, Sarangabader Itihas, p.3.
13. Census of 1951–24-Paragans District Handbook, p. xiii.
14 Nakur Chandra Mitra, op.cit., p.4. Also Sudhindranath Bandyopadhyaya, Behala Janapader Itihas.
15. Indian Journal of Landscape Systems & ecological studies vol. 11, No.2, Dec.1988— West coastal eco-system & its conservation in West Bengal by Ashis K. Paul, p. 89.
16. Ibid.
17. Geographical Review of India, vol.50, No.1, March 1988 – Coastal Dune System of the Sundarbans by Ashis K. Paul.

17A. Ibid.

18. Ibid.
19. Ibid.

20. Geographical Review of India, vol.49, No.1, March 1987– Morpho-ecological variation in the Sundarban mudflats by Ashis Paul, et.al.
21. Somprakash – Saradiya 1365 B.S., No. 1, 2nd year History of 24-Par ganas by Asoke Chatterjee.
22. Ibid. The road running from Katiganga to Karunamayee Ghat on the bank of Tollygunj Adiganga was known to the older generations as Dwarer Jangal. Vide Sundhindra Nath Bandyopadhya – Behala Janapader Itihas, p.38.
23. Vide Report, S.D.B.
24. Working Plan for the forests of Sundarbans Division for the period from 1st April 1931 to 31 March 1951, vol. I, by S.J. Curtis, Deputy Conservator of Forests, pub. in 1933.
25. Final Report on the Survey and Settlement operations in the district of 24–Parganas for 1924–33, pub. in 1936.
26. S. L. De and A.K. Bhattacharjee — The Refugee settlement in the Sundarbans, a socio-economic study.
27. Ibid.
28. Internal migration in India, a case-study of Bengal, p.59 – by the author.
29. Ibid.
30. Ibid.
31. Ibid., p. 60.
32. Census of 1951, West Bengal, District Handbook, 24-Parganas, p.384.
33. Census 1961, 24-Parganas District Census Handbook, Series 22, part X–A, p.37.

33A.Census 1971 Ibid. p. 37.

34. Census 1981 24-Parganas part XII & pp. 12–13
35. Census of 1991, Primary Census Abstract.
36. Vide Imperial Gazetteer of India, Provincial series, Bengal vol. I, 1909, p. 371. Out of a total area of the United Sundarbans comprising 6526 sq. miles, 2688 sq. miles were included in Khulna, 897 sq. miles in Backarganj and 2941 sq. miles (or 7352 sq. km.) in India;
37. Geographical and Statistical Report of the districts of Jessore, Fureedpur and Backarganj (1868), p. 26.
38. Prabasi – Sravan, 1357 B.S., pp. 340 – 45 – Prachin Yuge Paschim Sundarban by Kalidas Dutt.

39. Same as FN 37, p. 28.
40. A list of natural calamities has been appended to the chapter.
41. Pratap Chandra Ghosh – Bangadhip Parajaya, 571.
42. Kanan Bagchi, The Ganges Delta (1944), p. 85.
43. Vide Bagchi, ibid., p. 89.

CHAPTER-II

Early references to the deltaic region in literary and other sources – Controversy over whether the Sundarbans were populated and inhabited before the colonial era. References to ancient sites of culture and civilization in the region and instances of some relics discovered at the sites.

Early references in literary and other sources

The terrain traditionally known as the Sundarbans is not a colonial legacy. Its existence may be traced back to a remote past, to the pre-Christian era. The evidences of such existence are furnished by literary and other sources which mention the lower or South Bengal without, however, any specific reference to the Sundarbans before the 19th century. There are references to South Bengal in the Ramayana, the Mahabharata and in the Puranas. Both Valmiki's Ramayana and the Puranas mention the episodes connected with Maharshi Kapil, the great exponent of Sankhya philosophy, Kapil Muni of Sagar Island, and Bhagirath, a scion of Sagar royal family. The episode relating to Maharshi Kapil is to the effect that Devaraja Indra stole the horse meant for 'Aswamedha Yajna' organized by King Sagar of the Ikshvaku royal family and kept it concealed at the hermitage of Maharshi Kapil at the Sagar Island. Meanwhile, while searching for the horse, King Sagar's sons discovered it at Maharshi Kapil's custody and adjudged him guilty of the misdeed. Maharshi Kapil flew into a rage and cursed all his 'sixty thousand' sons who were all consumed into ashes. Centuries afterwards, Bhagirath propitiated Ganga through Mahadeva and brought her down the earth, with the result that as the ashes of the dead sons were washed by the sacred Ganga water all the sons were brought back to life. Centuries afterwards, another saint who was famous under the name of Kapil Muni set up a hermitage at the southern end of the Sagar Island, which the terrible earthquake of 1897 completely washed away along with the huge stone image of the Muni. This gave rise to the current Lohachara Gong and led to the forma-

tion of two islands. Lohachara and Ghoramara. Subsequently, Kapil Muni's temple was built anew to the north of the former one. To this newly built temple pilgrims now repair to earn religious merits.

Whatever the substratum of the historical fact or the kernel of historial truth in the above episodes of Maharshi Kapil and Kapil Muni, the episodes at least establish the existence, in that remote age, of the Sagar Island or the existence of the south 24-Parganas being the area of the Sundarbans, though then known under the name of the 'forest region'. This is tantamount to the fact that the Sundarbans' existence went as far back as the era of the Ramayana. Kalidas, the court poet of the Gupta sovereign, Chandragupta II, (5th century AD), refers to lower Bengal in his Raghuvansam (Canto 36, Sloka No. 36) [1] in connection with the naval battle of Raghu with the Vangas who are described as having fleets of war-boats and a strong force of elephants. The Valiant Raghu defeated the naval forces of the Vangas and established pillars of victory on the isles in the midst of the Ganges. 'These islands, in all probability, represented the present area of the 24-Parganas which was still a fen-land intersected by rivers and full of morasses.' [2]

The Mahabharata also mentions lower Bengal in the course of the narrative after the Bharata War. Yudhisthir after being crowned Emperor paid a visit to the Sagar Island to have a holy bath at 'Sagar Sangam' (Vanaparba).[3] This establishes the existence of the Sagar Island even in the age of the Mahabharata. Again, on the eve of Yudhisthir's Rajasuya Yajna, his brother Bhimsena who was entrusted with the conquest of the eastern part of India, invaded lower Bengal which then stood parcelled out under different rulers.[4]

Both the epics thus refer to lower Bengal which is identifiable with the Sundarbans of the later days. Authorities are not agreed on the dates of the story of the Ramayana and of the Bhrata War. Dr. Hemchandra Roychowdhury calculated the beginning of the Bharata War at 3102 BC while, in the computation of M.M.Haridas Siddhantabagis, the war took place in 4100 BC. The Treta Yuga or the Age of the Ramayana is traditionally considered as older than the Age of the Mahabharata. The geographical existence of Bengal or South Bengal , which is the site of the future Sundarbans, may thus be reasonably treated as dating as far back as the age of the Ramayana and the Mahabharata.

Ptolemy's map of India (2nd century AD) shows a town Palaura by name between the two rivers, the Meghna and the Kambyoson (Kambosin ?), near the coast of the Bay of Bengal. The town offers an indirect evidence of the existence of the deltaic lower Bengal in the 2nd century AD when the south of the delta, as shown on the map, was cut up by rivers and estuaries to such an extent that it was practically a collection of islands.

Later in the 7th century AD, the deltaic lower Bengal formed part of the land of Samatata which the Chinese pilgrim Hiuen Tsang (Yuan Chwang), described 'as a low-lying country bordering on the sea and rich in crops, flowers, and fruits. Its climate was soft, its inhabitants were small in stature, of black complexion, and hardy. Buddhism was represented by 30 monasteries and 2,000 priests but the number of Hindu temples was far greater.[5] According to Cunningham, Samatata included the whole of the delta between the Bhagirathi and the main stream of the Ganges, having its capital at Jessore. Probability, however, is that the capital was at Dacca or Vikrampur.[6] With its capital whether at Jessore or at Dacca, Samatata appears to be another name for Vanga 'on account of its flat low coast-line.' Samatata is also mentioned as a tributary frontier kingdom of the Gupta empire in an inscription of Samudragupta (4th century AD). Again, Yasovarman of Kanauj (c.731 AD) is credited with the conquest of Vanga in the Prakrit poem Gauda-Vaho.[7] Any way, the above-mentioned Ptolemy's map, Hiuen Tsiang's account, Cunningham's statement, Samudragupta's inscription, and Gauda-Vaho, all seem to justify the existence of the Sundarbans, identifiable with lower Vanga, in the historic age.

The evidences supplied by poet Bipradas Chakravarti (1495), Kabikankan Mukundaram Chakravarti, and Ain-i-Akbari also establish the existence of the Sundarbans long before the period of reclamation, namely in the 15th and 16th centuries AD. Bipradas Chakravarti who hailed from the village of Batagram described in his 'Manasar Bhasan' the voyage of his hero, merchant Chandsadagar, from Burdwan to the sea. He passed by several river-side villages from Bhatpara to Baruipur. He also passed by Ariadaha, Ghusuri, and Calcutta. There Chand proceeded down the Adi-Ganga, which was formerly the channel by which the waters of the Ganges found their way to the sea.[8] With Chand's voyage is associated the place-name Neti Dhopani, east of the Matla in the Sundarbans.[9]

Chand had his shipyard by the side of the river 'Chander Ara' flowing west of the mouth of the Haringhata. Further west is situated 'Kalidaher Khal.' The heap of bricks near the place, called Tiger Point, on the western corner of Haringhata perhaps bear witness to some ancient port.[10] Mukundaram Chakravarti's Kavikankan Chandi composed in the 16th century and Krishnaram's Raimangal Kavya written in the 17th century contain references to the village of Barasat. The two merchant heroes of Kavikankan – Dhanapati Saudagar and Srimanta – made voyages to Sinhala (Sri Lanka) with a mission to trade along the route of the Adi-ganga. Tradition has it that the name Barasat derived from Srimanta Saudagar's worship of 'Bara Thakur', a presiding deity of the Sundarbans, on the eve of his departure for Sinhala.

Bengal including the Sundarbans is mentioned in the government documents of the Mughals. Akbar's Finance Minister, Todar Mall, completed the Rent-Roll or revenue document, called Asli Jama Tumar, in 1582. In that Rent-Roll, a copy of which is preserved in Ain-i-Akbari, the then Bengal was divided into 19 Sarkars or revenue divisions containing 689 mahals, 24-Parganas being under Sarkar Satgaen and its revenue was assessed at 10,693,067 Akbarshahi rupees. Todar Mall, however, did not assess the Sundarbans. His Rent-Roll remained in force till the end of the regency of Aurangzeb's brother, Shuja, who refixed the Bengal revenue at 13,115,907 rupees shortly before 1658. The increase of more than 24 lakhs in revenue over the Asli Jama of Todar Mall may be accounted for by such new additions to the Rent-Roll as Hijli, Midnapur, Jaleswar, portions of Kuch Bihar, Western Assam, Tipperah, and above all, portions of the Sundarbans, if not actually reclaimed. Thus Shuja's Rent-Roll mentions the Sundarbans which was for the first time assessed a short time before 1658. Todar Mall included Bengal in his Rent-Roll though he did not assess the Sundarbans. The first historical reference to the area identifiable with the Sundarbans may, in the circumstances, be traced back to the 16th century or to the reign of Akbar. But the fact remains that the Muhamedan historians, as noted in chapter I, used the term Bhati in respect of the Sundarbans, and Shuja's Rent-Roll described the area as Murad Khanah or Jerad Khanah. The name Sundarban had come into official use in British India since the early 19th century. The extension of the name to the whole coast is modern (Hunter).

The past memory of the Sundarbans is associated also with the Adventures of Khan Jahan or Khanja Ali and Pratapaditya of Jessore. About the middle of the 15th century, Khan Jahan obtained a Jagir from the King of Gaur and extensively reclaimed the land near Bagerhat in Khulna. He appeared to have exercised all the rights of sovereignty until his death in 1459. A hundred years later when Daud, the last King of independent Bengal, defied the Delhi Emperor and was defeated [11] in 1575, one of his Hindu counsellors, called Vikramaditya, obtained a Raj in the Sundarbans, the capital of which was Iswaripur near Kaliganj Police Station in Khulna. Iswaripur was called Yasohara which has given its name to the district of Jessore.[12] His son, the valient chief Pratapaditya (16th century), one of the Barah (twelve) Bhuhiyas, who were nominally vassals of the Mughal Emperor Akbar but really enjoyed independence in the south and south-east of the Ganga delta, set up his abode in the not-easily accessible Sundarbans area to fight against the Mughals. He was finally overpowered and defeated by the then Governor of Bengal, Man Singh (1589–1604). Pratapaditya set up a rival city at Dhumghat, identified by H. Beveridge with Chandikan, which, again, is identified with Sagar Island. Gradually, he extended his dominion over the entire deltaic land bordering on the Sundarbans, embracing that part of the 24-Parganas to the east of Ichhamati and all but the northern and north-eastern parts of Jessore.[13] Pratapaditya built a fort at Kamalpur near the Kholepetua river, besides the fort at Dhumghat. The existence of a dock near Kholepetua, is in evidence, though when and by whom it was built nobody knows for certain. [14]

Chandikan or Sagar Island was in Pratapaditya's days an important seat of maritime power in Bengal. Bearing on this point Radha Kumud Mukherjee writes: [15] 'Numbers of men-of-war were always to be found ready for battle and in a seaworthy condition at that naval station. There were three other places where Pratap built his ship-yards and dock-yards. These were Dudhali, Jahaja-ghata and Chakrasi where his ships were built, repaired, and kept.'

The Census of 1951, Handbook of 24-Parganas, supplies the following salient facts about Pratapaditya : 'Pratapaditya is identified with the King of Chandecan or Ciandecan who is mentioned several times in the letters of Jesuit missionaries who visited Bengal at the end of the 16th century. The first to come to Bengal were

two priests, named Fernandez and Josa, who on their arrival at Hooghly in 1598 were invited by the King of Chandecan to pay him a visit. The account of their journey given by Fernandez shows that the route lay through the Sundarbans, the King holding his court at a place half-way between Chittagonj and Hooghly. The King's dominions were extensive. It would take 15 to 20 days to traverse them. The country had a great trade in bees' wax which was produced in the jungles. It was infested by dacoits. He and his companions encountered great dangers both from them and from tigers before they reached Chandecan. Next year Josa was joined at that place by another jesuit priest named Fonseca who wrote that the King received him with great kindness. A church was even built at Chandecan which was dedicated to Jesus Christ. A few years later, in or shortly after 1602, some jesuit priests went to Chandecan with Carvalho, the Portuguese Commander of the island of Sandwip. The King promised to befriend them but meditated treachery. He summoned Carvalho to 'Jasor' and there had him put to death.'

Even in the face of such proofs of the life and lively existence of people in the lower Bengal deltaic region in the past some western pandits and geologists are sceptic about whether the region was populated and inhabited before the colonial era. Conservative western scholars are of the conviction that lower Bengal had been covered with forests and unfit for cultivation and habitation since creation and that the terrain became cultivable and habitable only after the initiation of the policy of reclamation in the 19th century by the colonial government. Occasionally some adventurous people made attempts to settle there and cultivate land but they did not succeed because of the inhospitable and inaccessible nature of the area. The geologists likewise hold that the deltaic region of lower Bengal is very young in age and had no existence in ancient times, the region having been of recent formation by the deposits of silt of the Ganga-Brahmaputra river-system. The discovery of relics of art and culture of very ancient period predating the Christian era in different parts of the region, however, establish to the contrary that the region was anciently populated and had seen a glorious past as for back as the pre-Christian era.

Hunter raised the issue—were the Sundarbans anciently populated ? He supports Col. Gastrell who is doubtful of the Sundarbans having been anciently populated. Col.Gastrell writes in his Rev-

enue Survey Report: 'Some ruins of missionary buildings, the traces of old courtyards here and there, some garden plants and shrubs remain to the present day in lot 211 close to the khal which separates it from lot 212 and attest in some measure the truth of the legend (that is, anciently populated). But by whom the holdings were erected or when inhabited, no one seems to know. Remains of brick-ghats and traces of tanks have also been found in isolated parts of the forest, and in one or two locations brick-kilns too were disclosed. There can be no doubt that settlers did occasionally appear in the Sundarbans in olden times but there is nothing to show that there was even a general population in the Sundarbans lower than its present limits of cultivation'. Col. Gastrell further states: 'Excepting the country bordering on the Passar river, if ever the Jessore portion of the Sundarbans were populated lower than the present line of forest boundary, which I much doubt'.

H. Beveridge also raised the same issue, namely whether the Sundarbans were inhabited in ancient times in the journal of Asiatic Society of Bengal, vol. XLV, Part I, 1876, pages 71 ff. Giving his views, Beveridge wrote: 'This is a question which has exerted a great deal of attention. Bengali mind maintains the view that there were formerly large cities in the Sundarbans. Some Bengalis also have suggested that the present desolate condition of the Sundarbans is due to subsidence. It seems to me very doubtful, indeed, that the Sundarbans were ever largely populated and still more so that their inhabitants lived in cities or were otherwise civilized. As regards the eastern half of the Sundarbans, it seems to me that the fact of so much salt having been manufactured there in old times militates against the view of extensive civilization; for the salt could not have been made without a great expenditure of fuel which, of course, implies the existence of large tracts of jungle. Du Jarric speaks of Sondip (situated in the east Sundarbans) as being able to supply the whole of Bengal with salt, and it seems evident that in old times salt was reckoned as the most valuable production of this part of the country. How inimical this must have been to a widespread cultivation of the neighbouring tracts may be judged from the fact that in modern times the salt manufacture by Government was a great obstacle to the clearing and the colonization of the Churs and islands, as the government officers insisted on the jungles being maintained for salt manufacture. I may also notice here that

the copper-plate inscription found at Idilpur in Backarganj and described in the Asiatic Society's journal for 1838 seems to imply that the inhabitants of that part of the country belonged to a degraded tribe called Chandabhandas, a fact which is not favourable to the support of an early civilization of the Sundarbans.' Continuing further Beveridge wrote that a jesuit priest who arrived at Chittagong sometime in 1599 described the area as a 'horrid jungle'. Again, Beveridge contented that the fact that Pratapaditya's father, Vikramaditya, chose Jessore as a safe retreat was the strongest possible evidence of the jungle-nature of the surrounding country. Though Jessore had been cultivated by Khanja Ali in the 15th century, the cultivated area relapsed into jungle at the time of his successor. Finally, Beveridge opined that the Sundarbans had never been in a more floursh ing condition than 'at present' (obviously 19th century) and that he did not believe that the 'gloomy Sundarbans or the surface of Jessore and Backarganj were ever well peopled or the sites of cities.'

Blochman and Westland also held the same views on the subject. Westland in his Report on the district of Jessore (1874), wrote: 'That the Sundarbans were at any time a generally populated region I have never seen any evidence to show but it seems to me beyond doubt that settlers have occasionally appeared in various parts of the Sundarbans and have again disappeared.' Westland considers it to be a fact that in isolated parts of the Sundarbans region remains of brick-ghats and traces of tanks were found but no permanent houses. 'There is nothing wonderful in people building masonary ghats to their tanks who themselves dwelt in non-permanent houses.' The great obstacle to their permanent habitation came from the Mugs and the Portuguese. The tradition of permanent settlement grew in the wake of the reclamation since the colonial epoch.' Westland, however, left it undecided 'whether these petty colonies of settlers that used to come down to the Sundarbans region left the place willingly or because they were driven away or because they died off.' The fact however, remains that people had their permanent abode in different parts of the Sundarbans even in the pre-colonial age, though natural calamities and Mug-Portuguese atrocities compelled them to leave their permanent abodes to seek safety in remote areas.

Like the Western scholars, geologists also argue against the permanent habitation of people in the Sundarbans region in ancient times, though on different grounds. Geologists and historians differ in their conception of ancient period. From historical point of view a few-thousand-year old history falls within the ambit of ancient age while from the geological view-point a development to be called ancient must have taken place millions of years ago. Geologists hold that the so-called deltaic region lay immersed under the sea-level till only two or three thousand years ago and that the formation of the delta dates back only to recent times after the flow of the Bhagirathi, the main channel of the Ganga, changed over to the Bhairab and then to the Padma by the 16th century. Arguing on such lines, the geologists consider the Sundarban region as 'young in age', ignoring the exploration of ancient relics and symbols of art and culture in different parts of the region. The geologists thus rule out the possibility of the region having been anciently inhabited by people.

Rev. J. Long believed in the pre-colonial habitation of the Sundarbans region. At a meeting of the Asiatic Society of Bengal (Calcutta), held on 2 December 1868 under the Chairmanship of T. Oldham,[16] Long read a paper in which he recorded the following fact bearing on the subject: Long stated that when in Paris in 1848 Monsieur Jomard, Head of the Geographial Department of the Bibliotheque Royale, showed him a Portuguese map of India more than two centuries old (that is, of the Mughal age) in which the Sundarbans were marked off as a cultivated land with fair cities therein. This was confirmed by a map in De Barros' Da Asia, a standard Portuguese history, and by the map of Vanden Brook. The fine cities were the five famous sea-port-towns, namely Pacaculi, Cuipitava, Noldy, Dapara, and Tiparia. Besides these, as shown on the maps, Rev. Long said, there were many other famous towns in the Sundarbans area at the time. The above port-towns could not have been correctly pronounced and hence not spelt correctly. For instance, Pacaculi may Penchkuli now under Diamond Harbour subdivision; Cuipitava might be identified with Khalifabad; Dapara might be the city of Daspara on the southern coast of the river Kalcca; Noldy may represent the present Nalua or Naldia. Adjacent to Nalua are Manir Tat and Nalgarah Abad, near which have been found some remains of an old fort. To the south of this fort stands

the famous Jatar Deul. Tiparia was the corruption of Tripura. Continuining further Rev. Long said that two years ago he had examined Tarda town not far from port Canning which had been the port of the Portuguese before Calcutta was founded. It was once an emporium of trade, and ships must have sailed up by the Matla but no ruins remained. In his paper Rev.Long admitted having seen 'a fine Hindu temple two centuries old,' 40 miles south of Port-Canning. Continuing further Rev. Long said that at the request of Hon'ble J. Colvin, the late Lt. Governor of N.W. Provinces, 16 years ago he published in Bengali the life of Rajah Pratapaditya under the original title 'the last King of Sagar Island, who lived in the days of Akbar and built a city in the Sundarbans, the remains of which are to be found at Ishwaripur. The Mug and Portuguese depredations in alliance with devasting cyclones finally led to the depopulation of the Sundarbans. The cyclone of 1680 carried away more than 60,000 people. As late as 1824, the Mugs were an object of terror even to Calcutta. In 1760, the Government had a 'bundh' thrown across the river near the site of the Botanical Gardens to prevent both the Mugs and the Portuguese vandals from entering Calcutta.

At the same meeting of the Asiatic Society, another speaker, H.J. Rainey, second son of Khulna's Rainey Saheb, spoke of the pre-colonial habitation of the Sundarbans region in his paper on 'the Sundarbans and Pratapaditya.' He proceeded to establish that the Sundarbans 'originally' were not only populated but apparently equally, if not more, advanced in civilization than the country lying immediately to the north of it. The remains of temples, mosques, and other buildings of symmetry and even magnificence are supposed to prove this. These appeared to have belonged to both the Hindus and the Muslims, though the latter predominated. Rainey at the same time showed that at the time of Pratapaditya, though parts of the Sundarbans were populated, a great portion remained still wild and uncultivated. So far as Jessore was concerned, best and favourably placed portions of the land were cultivated after his death. The Sundarbans were, however, exposed to the predatory incursions of the piratical Mugs and the Portuguese buccaneers who quite sufficed to scare away 'the timid and probably disunited population.' The cyclone and storm-waves of 1737 carried the depopulation further. A wave, 40 feet higher than usual, came up, sufficient

to cause an almost total loss of life in the Sundarbans and their consequent abandonment. The few remaining survivors abandoned the place and 'moved northward where finding sufficient surplus land for their habitation and cultivation they never returned to the south.' Rainey's horizon was bounded by Jessore and, therefore, he did not refer to the spread of cultivation and habitation in other parts of the United Sundarbans in the pre-colonial age.

Indian scholars have not the least shadow of doubt in their mind about the pre-colonial habitation and cultivation of the people in the Sundarbans area. The author of 'Vangadhip Parajaya' in two volumes (a romantic historical writing on Pratapaditya) and a former Assistant Secretary, Asiatic Society of Bengal, Pratap Chandra Ghosh, collected much useful information on the Sundarbans. He referred to the Gangetic delta as a populous area and laid the responsibility for the destruction of the cities at the mouth of the Ganges at the door of the Mug and Portuguese pirates. The remains of such ruined cities are found, according to Pratap Chandra Ghosh, in Lot Nos. 116, 211, 165, and 146. He has also mentioned the cyclone and deluge of 1585 and 1737 which drowned thousands of people in the sea. Obviously, the area was then well populated. Indeed, ruined temples, architectural stone fragments, relics of urban life, which came to light in the previous centuries during the clearance of jungles would confirm the supposition that the Sundarbans terrain was once a well settled, well populated, and flourishing area, subsequently transformed into swamps and jungles by the freak of nature. For our knowledge of the ancient relics of art and culture discovered among the ruined cities and habitations in the Sundarbans area we are immensely indebted, among others, to the Bengali scholars like Kalidas Dutt of Jaynagar-Majilpur and Satis Chandra Mitra, the famous author of 'Jesohar-Khulnar Itihas', 2 vols. The explorations or chance-finds of the scholars like them have extended the frontiers of our knowledge of the Sundarbans as the store-house of ancients works of art and civilization and as the habitation of people, rural and urban, since the remote past, since perhaps the Palaeolithic times, as evidenced by many stone-age tools discovered. Kalidas Dutt built up a rich museum of local antiquities, the best of which he since donated to the Asutosh Museum. 'To Sri Kalidas Dutt, scholarly Zamindar of Majilpur', writes Professor Debaprasad Ghosh, the late Curator, Asutosh Museum, 'we are indebted for the

present state of our knowledge about the antiquity of the Sundarbans. The results of his archaeological researches personally conducted by him in the Sundarbans have illumined a dark, forgotten corner of Indian history and have been published in Varendra Research Society's Monograph Nos. 3, 4 and 5. Some of the remarkable examples of Indian sculpture of the early and late medieval period collected by him from this area are now preserved in the Asutosh Museum.' [17] If there were works of art and evidences of life and culture in the Sundarbans area in ancient times, as established by Kalidas Dutt, there were human habitations, thick and lively, for obvious reasons in the pre-colonial era.

Satis Chandra Mitra, introduced earlier on these pages, has also furnished numerous evidences of human habitations in the Sundarbans region both in the pre-historic and historic periods in his 'Jasohar-Khulnar Itihas'. Sagar Island, Kapil Muni, Chand Saudagar, his dockyard at 'Chander Ara', Dhanapati and Srimanta Saudagars voyaging to and from Sinhala, a building now in ruins on the dead Bhola river to the west of Smaran Khola forest station, Nandatata and Kumudtata (the two khals to the north of Pasai river), Pratapaditya and his forts at Dhumghat and Kamalpura, his dock-yard at Kholepetua, his Sivasha fort and the Siva temple now in ruins—evidences of the existence of all these and many others crowd the pages of Mitra's valuable volumes in support of the glorious past of the Sundarbans and the ancient habitation of the region.[18] A reference, in this connection, may be made to Mr. Mitra's other noteworthy discoveries such as tanks here and there, two or three brick-built structures and numerous habitats of people, not far from Pratapaditya's Shivasha fort. A little farther away stood a fine ornamental temple, almost intact, observed Mr. Mitra.[19] Mr. Mitra claims to have written about the Sundarbans' past after seeing the south of the region with his own eyes and after personally hearing from some trustworthy and educated visitors there. His firm conviction was that time was when the Sundarbans area was fit for human habitation. Its land then smiled with a lush growth of vegetation. Its cities were rich in structures and temples and resonant with human voices. Many a time, however, did the Sundarbans, he held, witness its rise and fall – the decline in particular which set in towards the end of the Buddhist age. The revival took place with the coming of the Hindu rulers to power, The Sundarbans again declined

in the Hindu period but revived in the Pathan age; it fell again during the middle age of the Mughals, not to revive till before the colonial era. The foreigners who visited the Sundarbans during the early part of the Mughal Raj for trade and commerce, Mr. Mitra held, had not seen the Sundarbans so inaccessible, inhospitable and overgrown with forest and abounding in ferocious animals.[20]

In the course of delivering his Presidential address at the 15th session of Bangiya Prabasi Sahitya Sammelan (History Section) at Patna, Principal Nanigopal Majumdar also spoke about the existence of so many villages and towns in the south 24-Parganas during the Gupta and Pala ages and held, unlike the geologists, that historians would not belittle the importance of the Sundarbans area by calling it 'young in age.' [21] According to M. M. H. P. Shastri, even about thousand years ago, different areas of the district of the 24-Parganas, contained Buddhist Vihars where Buddhist scholars used to consult Buddhist manuscripts and preach the religion of Lord Buddha. Even in the now-neglected Hatiagarh and Balanda Parganas (both situated in ancient Jessore) there were then Buddhist Vihars where Pandits held discourses on 'Prajna Paramita'. [22] Pandit Shastri's statement is indicative of the ancient existence of the Sundarbans area.

Here is an official view of the ancient existence of the Sundarbans and the civilized life that flourished there in the remote past. In a letter of September 1885 written to Hunter, Director-General of Statistics, Government of India, the then Officiating Collector of the 24-Parganas, A.W. Paul, wrote that in the Sundarbans portion of the 24-Parganas, in the course of reclamation of the forest area, several brick-built houses, tanks, buildings surrounded by moats had been discovered and that these went to prove that 'several centuries ago' these tracts were the sites of populous villages which had been deserted 'probably in consequence of storm-waves and similar other providential visitations'.

To cite another official view of the glory that was the Sundarbans in the past, Rai Saheb Anil Chandra Lahiri, Deputy Collector, 24-Parganas, wrote in his 'Final Report on the Survey and Settlement operations in the district of the 24-Parganas for 1924-33 :

> 'It is interesting that the Sundarbans, which were infested with ferocious animals and resorted to as a haven by the Portuguese and Arakanese pirates, could be an ancient seat of civilization.

The architectural relics found in existence in the Sundarbans throw considerable light on the question. The huge Deul, dilapidated old buildings in G. Plot almost near the Bay, the mosques in lots 129 and 58 and the physical features of places like Konkandighi lead one to believe that the vast tract, designated as the Sundarbans, was once prosperous villages during the early Mughal reign. The depredations of pirates may have compelled the people to migrate northward from the rivers and the sea and thus allowed the once flourishing villages to revert into thick jungles.'

The views of a select few authorities on the Sundarbans region having been anciently inhabited and populated have been presented above by way of illustration. Our knowledge of the ancient habitation of people of the Sundarbans and of their civilized ways of life is based essentially on the works of art, images of gods and goddesses, ruins of places of worship, brick-built dwelling houses, paved ghats, coins, terracotta seals, old and new stone-age houses, tanks, weapons, potteries etc., which were discovered as so many chance-finds either on the surface or while digging tanks etc. or in the course of reclamation and were collected by local enthusiasts like Kalidas Dutt of Jaynagar-Majilpur. Many ancient relics of the Sundarbans are also preserved at the following repositories:[23] 'Balanda Pratna Sangrahasala' at Haroa, ' Sundarban Anchalik Sangrahasala' at Baruipur, 'Kalidas Dutt Smriti Sangrahasala' at Jaynagar-Majilpur, 'Chandraketu Garh Sangrahasala' at Berachampa, 'Kalidas Dutt Sangrahasala' at Ramnagar, 'Mandirtala Sangrahasala' at Bamankhali, Sagar Island, 'Ramkrishna Mission Sangrahasala' at Manasadwip, ' Banga-Bharati Sangrahasala' at Namkhana-Narayanpur, ' Gangaridih Research Centre' at Kakdwip, 'Guru Saday Dutt Museum' at Thakurpukur, 'State Archaeological Museum' at Behala etc.

Some of the ancient sites rich in archaeological relics testifying to an aesthetics sense of the Sundarbans people and to the climate of culture and civilization prevailing in the region in the past are mentioned below, not exhaustively but by way of illustration :

(1) Early architectural stone fragments found at Boral in Sonarpur Police Station (1961 census, vol. II, District Handbook, 24-Parganas, p. 21).

(2) Neolithic stone articles, discovered by Kalidas Dutt — a smooth cell made of trap stone, found at Harinarayanpur, Kulpi Police Station; a hammerstone of sand-stone found in the same region, both being discovered in the course of digging a tank and khal at a low depth sometime in 1366 B.S. (Prabasi, Baisakh, 1366 B.S.) - pp. 38-40- Pragaitihasik Yuge, 24 Parganas, by Kalidas Dutt.

(3) Explorations at Harinarayanpur, about 4 miles south of Diamond Harbour—terracotta figurines including some remarkable Sunga figures representing Yakshines; copper-cast coins mostly round, some being punch-marked; terracotta figures of Mother Goddess; prehistoric terracotta seals, discovered for the first time in Bengal at Harinarayanpur. 'Terracotta art found the most favourable atmosphere for development in plains watered by rivers, abounding in soft clay and lacking mountain and rock'. (A guide to the Archaeological gallaries of Indian Museum — C. Sivaram Murti). The figures discovered at Harinarayanpur belong mostly to the Maurya, Sunga, and Kushan periods. ' Surface-finds from Harinarayanpur are contemporary with the startling discoveres of Pandu Rajar Dhipi in Burdwan district.' (Census 1961, vol. II- District Handbook, 24-Parganas, p. 21).

(4) Chandraketugarh near Berachampa under Dviganga (Deganga) Police Station, falling on the way from Barasat to Hasnabad by rail. To the east of Chandraketugarh still flows the slender-bodied Vidyadhari river. On the relics discovered at Chandraketugarh Professor Debaprasad Ghosh wrote on 3.9.63: 'The explorations at Chandraketugarh (Berachampa) and its neighbourhood undertaken by the Asutosh Museum have resulted in the discovery of significant relics which may be safely assigned to the period between the Mauryas and the Guptas. Of the relics mention may be made of such objects as one hundred silver punch-marked coins – the earliest coins in circulation in India–and more than a dozen copper varieties bearing extremely rare symbols of a ship-motif; several terracotta seals inscribed with early Brahmi characters of 2nd century B.C. to 1st century A.D., and some intriguing pictographic marks; NBP (Northern Black Polished Pottery) fragments; portions of rouletted wares and wine vases of probable Roman origin; terracotta figures betraying Hellenistic influence in the folded tunic; stamped and inscribed shards of the Kushan period; some Mauryan and innumerable Sunga and Kushan terracotta

figurines of surpassing loveliness; a rare Gupta gold coin discovered for the first time in Bengal. Mention may also be made of a unique terracotta Suryya Chariot of the 2nd century B.C. recalling similar contemporary relief on the rock-cut cave of Bhoja in Western India.'

'The earliest Buddhist image so far discovered in Bengal has been recently collected from Khana-Mihirer Dhipi at Berachampa in the environs of Deganga. Representing a small fragment in red sand-stone, the torso of Buddha is reminiscent in almost every detail of the earliest seated Buddha in stone created by the artist of Mathura in about 1st century A.D. and, therefore must belong to the same period.'

Animals in terracotta unearthed at Chandraketugarh (also at Atghara) bear testimony to the local peoples' love, care, and affection for animal life. Even the rhinocerous was depicted in one terracotta plaque obtained from Chandraketugarh. (A.K. Mondal and R. K. Ghosh - Sundarban, a Socio-Bio-Ecological Study, p. 131).

(5) Atghara, situated near Bàruipur, was a prosperous place in the past. According to a report published in The Statesman on 8 December 1956, 'discoveries of an archaeological site about 2000 years old at Atghara near Baruipur, 24-Parganas, have led experts to believe that the lower Bengal region was once prosperous with cities and ports. The ancient site of Atghara near the dried-up bed of the Adi-Ganga has been discovered by the Asutosh Museum of Calcutta University. Copper-cast coins have been discovered there. Several extensive mounds and traces of ruins (ring-wells and walls) have led the Museum authorities to believe that Atghara might have been the site of a thriving city in the past and, therefore, can throw new light on the history of Bengal in the pre-Gupta period.' Coins and mounds besides, many terracotta and stone figures were unearthed while digging and reforming tanks. Between Atghara and its eastern neighbouring village, Sita-Kunda, were brought to light from underground level and the bed of tanks many a terracotta figure, yakshini figurine, clay seals, rouletted shards of the Roman type etc. of the Maurya age. Utensils of the Pala period, human figures, and images of Manasa of the Middle age as also the figure of Vishnu in stone have also been discovered at Atghara (Som Prakash, first year, No.1, 1364-65 B.S. – Atghara by Asoke Chatterjee, p. 6).

Thanks to the initiative of Asutosh Museum, Calcutta University, archaeological relics of Chandraketugarh, Harinarayanpur, and Atghara have been brought to light. It was, however, only in Chandraketugarh that the relics were discovered through scientific excavation, the reports on which are available in different volumes of the Annual Report from 1955-56 to 1966-67 of the Archaeological Survey of India.

(6) Chhatrabhog under Mathurapur Police Station, though reduced to a small village at present, had been larger in extent and famous as a prosperous Gangetic port in ancient times. Sri Chaitanya Dev graced the place by passing one night there on his way to Nilachal in the 16th century. Its antiquity is yet to be determined. Still it had been a rich area even before Bengal passed under Muslim rule by the 14th century. Its ancient archaeological importance is attested by the discovery of many images of Hindu gods and goddesses made of black stone of the Pala and Sena periods. Some ornate pillars and figures of Kuber and Garuda were also unearthed. (Prabasi-Magh, 1356 BS- Chhatrabhog by Kalidas Dutt, pp. 433-438).

(7) Khari : The village Khari which includes Khari, Gajmuri and other hamlets bears Tauji No. 93 of the 24- Parganas collectorate, is situated within the jurisdiction of Mathurapur Police Station about 4 miles south of the Police Station across the Bada (the old course of the Ganges). It was a flourishing area in ancient times but lay covered with forest for a long time. The fragment of its past glory came to view after reclamation was undertaken about the middle of the 19th century. The reclamation of the area is said to have been undertaken after a forest-fire when ruins of brick-built houses, temples, and tanks were exposed to view. According to Hunter (Statistical Account, vol. I, p. 235), from the heap of bricks north-west of the village Pratapaditya of Jessore removed two images, one of which he installed as Radha Ballava at Jaynagar, and the other as Shyamasundar at Durgapur Police Station, Jayanagar.

In the Gajmuri section of the Khari village there are in the house of Jagannath Thakur a Vishnu image about 3 feet high found in the course of excavating a tank and some fine architectural pieces of black stone.The image of Vishnu is of the usual four-armed type, holding a sankha (conch) in the lower right hand, a padma (lotus) in the upper right hand, a gada (club) in the upper left and a chakra in

the lower left hand. (Kalidas Dutt, an archaeologist of Bengal, 1895-1968, edited by Bibhuti Bhusan Bose, published by Kalidas Dutt Smriti Sangrahalaya, Jaynagar, Majilpur).

(8) Mani river and the seats of civilization on its basin:

The Mani river is on the south of Bishnupur. On the extensive area on its basin developed so many sites of ancient relics such as Raidighi, Kankandighi, Nalgora, Manir-tat, Khari (referred to above), and Chhatrabhog (also vide above). In fact, many inhabited regions grew up by the side of the Mani river within the jurisdiction of Mathurapur, Kulpi, and Jaynagar Police Stations. Khari-Chhatrabhog had long enjoyed the reputation of being port and brick-business centres. The Khari port was in close touch with the business centres from Chittagong, Jessore, Khulna, right up to Tamluk Khejuri. (Paschim Banga, Paryatan Issue, West Bengal Government, p. 393).

(9) Chakra-tirtha, near the Bhagirathi, a place of pilgrimage, referred to in Varaha Purana.

At present, this is represented by three bathing pools (Kundas) for holy bath—Gopal Kunda, Chakra Kunda, and Mani Kunda. Every year in the month of Chaitra, a fair is held, Nandar Mela as it is called. A reference to the holy bath at the three Kundas is found in Krishna Ram's Raimangal, composed in the 17th century (Prabasi, Magh 1359 BS - Kalidas Dutt, Chhatrabhog, p. 436).

(10) Raidighi (Lot No. 24) — It lies south of lot No. 23 and is bounded on the east and south by a stream. According to its present owner, Barada Prasanna Raichaudhury, it derives its name from a tank dug in the dry bed of a very old large tank by his ancestor, Sitaram Ray, the first lessee of the settlement. The old tank-bed measures 110 bighas according to recent survey. 'A stone slab inscribed in Sanskrit is reported to have been discovered in the tank. It was probably seen by Nakuleswar Bhattacharyya of Kalighat and is referred to in his novel called Kumudananda. The stone slab unfortunately is not now traceable.' Another important find is a Buddha image, which too is not traceable. The river Raidighi Gang is studded with ancient ruins on both banks. Foundations of buildings built of large bricks, exposed due to river erosion, are still visible there during ebb tide, about 16 feet below the present bank of the Gang. About 1880, a fine black-stone Digambar image, about 2½ feet high of the 23rd Jain Tirthankar, Parsvanath, was found in the

river by a fisherman and removed to Bolbamni Police Station, Matla, 'where it may be seen under a tamarind tree in the fisherman's quarters, being worshipped as Dharma Thakur.' Kalidas Dutt himself discovered in the Raidighi area two other Jain images — one being a Svetambara image of Naminath, 21st Tirthankar, and the other, a Digambara image of Adinath, the 1st Tirthankar (vide Kalidas Dutt, an archaeologist of Bengal, 1895-1968, edited by Bibhuti Bhusan Bose, p. 52).

(11) Kankandighi, Lot No. 26.

East of Raidighi across the Ganga is Lot No. 26, called Kankandighi under Mathurapur Police Station. The ruins at Kankandighi cover more than one hundred acres of land and are situated, with many brick mounds, near the temple of Jatar Deul. Three of the mounds, called Gajgiriir bati, Pilkhanas bati, and Svetrajar bati, specially the last one, are pretty large.Several stone pillars, door jambs, and other sculptures have been found there. One of these, a colossal Vishnu image of black shale, some 5 feet high and richly carved, is 'now in the house of a cultivator in the Sarifaltali sector of the village.' Another is a Navagraha slab, 3 feet 3 inches long and 1 foot 7 inches high, which was in the custody of the late Kalidas Dutt. It was unearthed by a cultivator from the ruins of Kankandighi. It was the practice in olden days to use such slabs as lintels over entrances to temples. (vide Kalidas Dutt, an Archaeologist of Bengal, Ibid. p. 53). Besides these, a beautiful Suryya image of bronze, some old potteries, as also other sculptures were unearthed 'a few years ago' from the area. 'From these and other numerous antiquities discovered in the adjoining area it appears that in the pre-Muhammadan age this place was the centre of culture of this part of the Gangetic delta.' (Indian Historical Quarterly, vol. IX, 1933.

(12) Jatar Deul: In the Sundarbans, the most important ancient architectural relic is Jatar Deul, a Shiva temple, in Lot No. 116, a short distance from Lakshikantapur Station . This is a lofty structure which still towers above the surrounding country. It is said that one Mr. Smith took a lease of the Lot in the seventies of the 19th century and knocked down the top of the tower in search of some hidden treasure. So its former height cannot now be ascertained. It is now about 96 feet in height. It has recently been brought under 'The Preservation of Monuments and Ancient Architecture

Act of 1904.' According to a copper plate, inscribed with an inscription in sanskrit and discovered at a place a little to the north of Jatar Deul, the temple was built in the year 897 of the Saka era corresponding to 975 AD. The copper-plate was discovered during reclamation by the grantee,Durga Prasad Chaudhury. It appears from the plate that a king named Jayanta Chandra constructed the temple on the above-mentioned date. It is not, however, known who this Jayanta Chandra was but at that time the whole of Bengal was under the sway of Pala kings who were Buddhists. Unfortunately, no trace of the copper-plate is available now.

Of the two legends current about the origin of the name of the temple, one is that this tract was frequented by a tiger which had Jata or clotted fur while the second one, which is referred to in the list of Ancient Monuments in the Presidency Division, is that the tower had a Shiva image known as Jatadhari.

On the plan of the tower, the following statement is found in the Kalidas Dutt Smriti Sangrahalaya Publication, edited by Bibhuti Bhusan Bose: 'The tower is square in plan with rectangular projections in the middle of each space. The entrance which is on the east is 9½ feet wide and is spanned by a pointed arch. The inside is about 10 feet square and the walls are about 10 feet thick. No plinth is visible and the floor is some 6 feet below the present level of the ground and is reached by a flight of steps. Inside the tower are brackets built into the wall. The tower is built of thin bricks laid in a cement of black colour and decorated with carved bricks some of which have fallen off. There is a large well north-east of the tower and a heap of old bricks to its north which is said to cover the ruins of an old room. There is no track of any image or worship in the tower. What purpose it served is now a conjecture.'

(13) Gupta brick temples: Remains of Gupta brick temples have been excavated at Dakshin Govindapur, revealing a facetted Sivalinga in sand stone, about 3 feet high, now preserved in Kantabenia, a neighbouring village. In shape and material, the image is affiliated to similar Gupta Linga in upper India. (Prof. D.P. Ghosh in The Amrita Bazar Patrika dated 25 Octo. 1953).

(14) Broken walls and other vestiges of brick temples from the Gupta and Pala periods have been found at Dakshin Govindapur (Lot. No. 114), Deulbari (15 miles east by boat from Raidighi), and other places. (1961 census vol.II, District Handbook 24-Parganas, Appendix II, pp.21).

(15) Sagar Island relics: The original hermitage of Kapil Muni went under water as a result of the earthquake of 1897. The existing ashram is a subsequent development. It was not possible for the generation following the catastrophe of 1897 to have any idea of the place of worship on the island: ' After ablution the pilgrims repaired to the temple dedicated to the divine sage Kapil Muni. In front of the temple was a banyan tree beneath which were images of Rama and Hanumana, and an image of Kapil Muni, nearly the size of life within the temple.' This was the position about 35 years before the quake of 1897, which destroyed all traces of human habitation on the Sagar Island. But such traces reappeared in the wake of the reclamation undertaken by the colonial government. Remains of tanks, temples, and roads were exposed, showing that the island was once densely populated. (Prabasi, Sravana, 1357 B.S. Kalidas Dutt, Prachin Yuge Paschim Sundarban, p. 344). The existence of old temples on the island in the 17th century has been established. Skanda Purana mentions the existence of an image of Linga (Siva) on the island. (vide Prabasi, Ibid). Again certain terracotta figurines, male and female, discovered on the Sagar Island in the late Kushan or early Gupta period (C 2nd- 4th century AD) prove, as Professor Debaprasad Ghosh writes in Amrita Bazar Patrika of 25 October 1953, 'the hoary antiquity of Sundarban in a conclusive way.'

(16) Pala art in the Sundarbans : Early Pala art of the 8th century A.D. is illustrated by certain small rectangular plaques in black slate showing Vishnu, almost primitive in vigour and two dimensional in form, discovered in Boral near Calcutta. Sundarban has also yielded ' some pieces of stone sculptures which do credit to the genius of Pala artists. Fashioned in the 11th and 12th centuries, they include a dancing Ganes, a Saraswati, an Adinath and a Sudarshan Chakra. (Prof. Debaprasad Ghosh, Ibid).

(17) In the village of Mandirtala on the Island have been found stone images and ruins of temples built in accordance with the artistic style of the Palas and Senas (Prabasi, Sravan, 1357 B.S.- Kalidas Dutt, Prachin Yuge Paschim Sundarban, pp. 340-45 Ibid.)

(18) Discovery of a Sundarban copper-plate grant of Dommanpala in the 12th century at Rakshaskhali, about 18 km west of Sagar Island. Dommanpala was a rebel feudal leader who taking advantage of the troubles that overwhelmed Lakshmanasena set up as

an independent chief in the eastern part of Khari (Sundarban) in 1196 AD, as shown in an inscription found in western Sundarbans. According to the inscription, Dommanpala belonged to the Pala family. But this is doubtful. 'Whether the family (of Dommanpala) was connected, in any way, with the Pala rulers of Bengal it is impossible to say. It is very likely that Dommanpala, son of a provincial Governor of feudal chief under the Senas, assumed independence and founded a principality in eastern Khari which is now represented by the Sundarbans where the plate (copper plate) was found.' (History of Bengal - I- Dacca University Publication, FNI, pp. 222-23). In this connection, Professor Devaprasad Ghose's observations deserve our attention : 'Perhaps the most important graphic record of Indian antiquity thrown up by the Sundarbans is provided by the engraved copper-plate grant of Dommanpala discovered by me in course of digging a mound in dense jungle in Rakshaskhali (F. Plot). The inscription, dated 1198 AD, written in Proto-Bengali characters on one side, lined with a thin layer of silver, refers to Purva-Khatika Mandala (Khari). A remarkable engraving, also unique in India, appears on the other side, representing Vishnu seated in a chariot with a devotee in front. It has now been accepted by scholars that this style of graphic art of Bengal probably influenced the development of schools of painting in contemporary and late medieval Burma, Siam, Java, and China.' (Amrita Bazar Patrika, 25 Octo. 1953).

(19) Relics at Bharat Bhayana : The village of Bharat Bhayana stands by the side of the Buribhadra river, 13 miles south on the way from Daulatpur to Satkshira. Near the village is a large brick mound or Deul which is identified with an old Buddhist Stupa. K.N. Dikshit, a former Superintendent of Archaeology, states: 'It still stands to a height of about 40 feet to 45 feet above the level of surrounding lands, though the local people say that before the earthquake of 1897 it was still higher. It is fairly circular in shape, its circumferance at the base being about 800 to 900 feet. It is full of bricks of large size, many of which have been removed by the inhabitants of the neighbouring villages. A modern temple close to the mound is reported to be built almost wholly with the materials vandalized from the mound. Some of the bricks here measure 16 inches × 13 inches × 3 inches, which bespeak a high antiquity for the stupa. Comparing with this, the dimensions of bricks of known

periods found in the excavations of Saheth–Maheth, it can be safely surmised that the Stupa at Bharat Bhayana dates back at least from the Gupta period, roughly 5th century AD. It is probable that this is one of the 30 Sangharamas mentioned by Hiuen Tsang as existing in his time in the Samatata country which modern Khulna must have comprised at the time. Steps are being taken to bring the mound within the provisions of the Ancient Monuments Preservation Act.(Vide Mitra - Jasohar Khulna, vol.I, FN 1, p. 212).

(20) Hatiagarh, Paran Basu's Khal, Bharat Garh (fort), Neti Dhopani : Situated between the Mani river on the east and Raidighi and Kankandighi on the west, Hatiagarh represents an old area which contained a famous Buddhist Vihara in the Buddhist age. Dhanapati Saudagar is reported to have offered worship to Ambulinga Siva and Nilmadhav here By the side of Paran Basu's Khal which has fallen from the matla river into the Vidya stands a large brick mound called Birinchir Mandir. On the north of the Khal, within Lot No. 128, a place is called Bharat Garh or Bharat Fort. In good old days, it was surrounded by a ditch and a brick-built wall, the ruins of which are traceable even today. It may be that the Bharat Garh was the fort of a king called Bharat, who set up an independent principality in Lot. 128 during the Matsyanyaya preceding the inauguration of the Pala Raj in Bengal and who is associated with the same Bharat in Bharat Bhayana. (Mitra - Ibid, 73-). East of the Matla, the island of Neti Dhopani is associated with the romantic adventurous voyage of the legendary Chand Saudagar and with the story of Behula and her snake-bitten husband, Lakhindar. Remains of a temple and rows of buildings have been discovered at Neti Dhopani. Rows of exotic Bokul trees found there are said to have once added to the beauty of a road .

(21) The Gupta Age coins at Uttar Surendraganj, a village under Patharpratima Police Station : To many the village is known as Harendra Chaudhurir Lot after the name of the late Education Minister, West Bengal, Harendra Chaudhury. Here have been discovered coins of the reign of Chandragupta II. The coins inscribed with the figures of Siva and Ox are preserved at Asutosh Museum.

(22) The Kushan Age findings : Mention may be made, among others, of some copper coins found in Lot No. 116 and of some earthen figurines discovered on the Sagar Island.

(23) Kalidas Dutt mentions some primitive antiquities from the

Sundarbans without specifying any place therein: They comprised hundreds of silver punch-marked and rectangular cast-copper coins– the oldest coins in circulation in India – some clay seals inscribed with Brahmi script, a fragment of a small stone-pillar with Asokan polish, a few Maurya and numerous Sunga and Kushan terracotta figurines, toy-carts of animals and plaques, depicting jataka and other ancient stories, several NBP shards and many pieces of grey and rouletted pottery ware. In this connection, Mr. Dutt writes: 'The discovery of these finds clearly show that this part of lower Bengal is not a newly born region, and (that) human civilization flourished here in the remote past. But unfortunately, for want of proper investigation, its earlier history is in darkness.' (Science and Culture, vol 27, 1961, June, pp. 275-278).

(24) Discovery of a Surya image: This was found by a villager about 1923, together with a Sivalinga of black shale in the course of excavating a tank at Kashipore village under Jaynagar Police Station of the Alipur Subdivision. 'The sculpture is 2 feet 5½ inches high and is made of bluish basalt stone. It shows a circular halo round the head. The Sun-god wears a cap-like head-dress from underneath on which curls of hair descend on each shoulder, a short necklace apparently of beads with a rectangular bar in the centre, plain bracelets and a long tunic. In each of his two hands he holds a lotus stalk. The waist is tied round by a belt, with two hanging tassels from the stud in the centre. Along the left side there is a sword kept in position by means of a strap. In front of the image is the figure of Aruna, the chariotteer of the Sun-god. Only the upper part of his body is visible. He holds a goad in his right hand and the reins of the Sun-god's horses in his left.'

'Beneath this figure, on the pedestal, is carved the body of the chariot with its wheels as well as seven horses. Below these carvings on either side of the bottom of the pedestal is a human figure in semi-prostrate posture.'

'This image of Sun-god has thick lips, a round face, and long-drawn eyes. His body is visible up to the knees and the posture in which he stands apparently shows that his legs are inside the hollow of the car.'

Commenting on the discovery of the image of the Sun-god, Kalidas Dutt writes: 'So far as I know, only one Surya image of this type has hitherto been discovered in Bengal and assigned, on the

ground of style, to the late Gupta period. It is now in the Varendra Research Society (V.R.S.) Museum at Rajshahi and comes from the Bogra district. In essential features, this image is almost similar to the one described above but differs in dress. The upper half of its body is bare like the later images and the lower half only is clad in short, tied round the waist.' (Indian Historical Quarterly, vol. IX, 1933, pp. 202—) .

(25) Many images of Hindu, Jain, and Buddhist gods and goddesses made of stone were discovered in the course of digging tanks etc. in different parts of the Sundarbans after reclamation, as claimed by Kalidas Dutt in Prabasi (Ashad, No. 3, 1359 BS, pp. 320-). He mentions, in particular, the discovery of an androgynous **(half-male and half-female)** figure of Siva at Bantra village under Jaynagar Police Station while digging a tank. The formation and costume of the figure lead to the presumption that it belonged to 12th century AD, writes Mr. Dutt. He also mentions the discovery of Siva's two attendants–Bull and Nandi. The figure of Bull was brought to light near the village of Kantaberia under Kulpi Police Station while the image of Nandi of black stone and one foot in height was found in Lot No. 29, Jaynagar Police Station. The Nandi image is worshipped in the house of Benimadhab Bhattacharyya of Majilpur while the figure of Bull is also worshipped under a tree not far off the village of Kantaberia (vide Prabasi; Ibid.) Besides these, 'a Nataraja' figurine made of stone, a copper image of Chandrasekhar, and several images of 'Uma-Maheswar' both of stone and metal had been unearthed, as stated by Kalidas Dutt. Regarding the image of Chandrasekhar, he writes : 'The copper image of Chandrasekhar Siva was unearthed by a farmer at Jaynagar. 'It measures about 7 inches in height and represents Siva standing in 'Samabhanga' pose on a full-blown lotus resting on a rectangular pedestal. The right hand is broken. It was most probably in 'varada mudra'. The left shows 'abhaya mudra'. Siva's costume consists of a tiger-skin through which the 'Urdha linga' is visible. He wears jata mukuta, kundala, necklace, a pair of bracelets and a pair of armlets. A snake serves as his sacred thread. The hood of it is shown above his right shoulder and the lower portion of its body is seen below his waist. The upper part of the body of the snake which adorned his chest is missing. There are a small image of Nandi in front of the pedestal and a trisula (trident) on the left side. The halo at the back of the

image is of oval shape with decorated borders.'

In this connection, Mr. Dutt comments: 'No other metal image of Chandrasekhar Siva has yet been discovered in Bengal. In South India, bronze images of this form of Siva have come to light but they are of a different type and belong to later periods.' (Vide Varendra Research Society Monograph, 3 + 5; Journal of Indian Society of Oriental Art, vol. IX, 1941, pp. 147-48; Prabasi, Asad, No.3, 1359 BS, pp. 320).

The discovery of the Siva images is indicative of the existence of Siva Sect in South Bengal near the Bay. Mention may be made here of the existence of a Sivalinga figure called Draksharameswar in the past near the Ganga sagar confluence. (Vide Prabasi 1359 BS, Ibid.).

Kalidas Dutt also mentions the ancient existence of a famous place called 'Sankel Madhav', on the Sagar Island. 'In one or two of our ancient Bengali manuscripts such as Kabikankan Mukund Rai's Chandi Kavya of the 16th century reference is traceable to 'Sonar Mahes' (Golden Siva) in Sankel Madhav. (Prabasi, 1359 BS, Ibid.)

(26) If Saivism had a hold on the Sundarbans area in the past, Jainism did not lag behind, as would be evident from the discovery of three Jain images of the Digambara Sect in the region–an image of Tirthankar Adinath No. 1, and two images of Tirthankar Parsvanath No. 23, as already referred to above. The image of Adinath was discovered in the village of Ghatesvara under Kulpi Police Station in the course of digging a tank. One image of Parsvanath was found at Raidighi, Lot. No.24 under Mathurapur Police Station while the other one was discovered at Kantaberia village under Kulpi Police Station (Pancha Pushpa, Ashad, 1339 BS, pp. 134-35).

(27) Sena Copper Plates : Of the 11 copper plates of the Senas in Bengal, so far discovered, three have been unearthed in the 24-Parganas—one relating to Vijaysena and the two others, to Lakshmansen ; one found at Lot No.22 under Mathurapur Police Station and the two others at South Govindapur under Sonarpur Police Station.

About three miles south-east of South Govindapur is situated an old inhabited area called Sasan. Both Govindapur and Sasan were rich in ancient relics. As stated in Panchapushpa, (p.238, edited by Amulya Charan Vidyabhusan, Sravan,1339 BS), from the ruins of

an old brick-mound covering an area of 2 or 3 bighas near the residence of Sachindranath Banerjee, a former Vice-President of Govindapur Union Board, have been found innumerable bricks bearing ornamental design. At Sasan also, an image of black stone was discovered some years ago.

Situated north-east of Govindapur, Mahinagar was reputed to be an old inhabited area which was in ancient days the abode of the Kayasthas of the Basu family. Mahinagar was named after a respected member of the Basu family, Mahipati Basu, who was a Minister under the king of Gauda, Hosain Shah. (Panchapushpa, Sravan, 1339 BS. Ibid.).

(28) Deulpota : Some old and new stone-age weapons were discovered in the village of Deulpota, a deserted village near Diamond Harbour on the old bank of the river Saraswati. The old stone-age weapons were made of quartz and those of new stone-age, of basalt stone. These stones are believed by experts to have been brought from Rajmahal hill area. (vide A.K. Mondal and R. K. Ghosh, Sundarban, a Socio-Bio-Ecological study, p. 129).

(29) Kesaveswar Mandir : South of Mandirbazar stands Kesaveswar Mandir, sixty feet high, constructed after 'Atchala' arch pattern in 1748 AD on a foundation five feet high. (Paschim Vanga, Paryatan Number, Oct., 1993).

(30) Mention is also made of the temple of Tripurasundari of Boral, the temple of Shyamsundar Jain of which the foundation stone was laid in 1821 AD by the side of Kulpi Road, the famous Kali temple of Mayda near Adiganga, and the temple of Brindaban Chandra at Mahespur under Mathurapur Police Station.(Ibid).

(31) Gangaridh : An ancient kingdom in lower Gangetic Bengal under the sovereignty of the Nanda dynasty of ancient Magadha. It had its capital at Gange by the side of the old Vidyadhari river flowing east of Chandraketugarh. Gange was also a port notable for its trade-transactions with countries like Rome, Greece, and Egypt. This is established by the discovery of some earthen cups made after the Hellenic Style. 'A remarkable maritime contact with the nations of the Greece-Roman world has been amply proved by the rouletted stands and a number of pottery cups'. (vide Somprakash - first year, 1364 BS. Also Narottam Halder- Gangaridi). On the eve of Alexandar's invasion of India in 326 B.C. Gangaridh is reported to have had in its possession four thousand war-elephants which

scared the Greek General so much so that he abandoned his idea of conquering Gangaridh (vide Ganga-hridaya Gangaridhi by Basudev Dutt in Abhati, 26th year, No.1). The discovery of Gangaridhi lends support to the view that the Sundarbans civilization dates back to the pre-Christian days.

(32) Some of the sculptures of 7th cen. AD–12th cen. AD, found in South 24-Parganas, as preserved at Asutosh Museum, Calcutta University, are mentioned below :

1. Suryya in black balast of 7th century, carried in a chariot, driven by 7 horses, Kashipur, South 24-Parganas
2. Torso of Vishnu in black balast–unique in carving 10th century AD, South 24-Parganas.
3. Sudarsan Chakra showing Vishnu dancing on Garuda on both sides of the chakra, 10th century AD, South 24-Parganas.
4. Vishnu in black balast, with Lakshmi and Saraswati, one on each side, Jessore, 12th century AD.
5. Nabagraha panel in back balast, 11th century, South 24-Parganas.
6. Temple pillar from the Sundarbans— square-base showing Shastriya motif, upper portion of round shape, 10th-11th centuries AD, the Sundarbans.
7. Uma Maheswar, 11th century, Raidighi, the Sundarbans.

Above have been mentioned some select sites of ancient civilization in the Sundarbans region along with the instances of some of the relics discovered at the sites — the sites and relics establishing ancient habitation of the people of the Sundarbans and their glorious past. Indeed, as Professor Debaprasad Ghosh aptly comments: Sundarban provides us with another forgotten chapter of Indian history. Coins and inscriptions, large number of images and sculptures –Brahmanical, Buddhist and Jain–in stone, terracotta, and bronze, beginning from the Kushan and Gupta periods, representing some of the outstanding examples of Indian art and antiquity of unique variety, have been discovered in the process of reclamation of forests largely within a span of last 70 years. Ruins of habitations and temples including Jatar Deul, the loftiest in Bengal, at least one thousand years old, scattered throughout the area often amidst impenetrable jungle and swamp still testify to the glory that was Sundarban.' (Amrita Bazar Patrika, 25 Oct. 1953, Ibid.).

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CHAPTER - III

Reclamation and settlement of the forest area — Revenue policy of the Government — Revenue from forest resources.

Reclamation of the forest area covering the estuarine Ganga-Brahmaputra deltaic lower Bengal was an affair of the colonial period. Forest overpowered the western part of the area after about 13th century and the eastern portion, by about 18th century, as noticed earlier in chapter I. In consideration of the urgency for human habitation and agriculture, for settlement and farm-land, the colonial government initiated and zealously followed up, from the latter part of the 18th century, the policy of clearing the forest, which was then the thickest possible wild growth of mangrove trees in the main. Mirzaffar Khan, the Nawab of Bengal, granted the 24-Parganas to the East India Company on 28 June 1757. The new grant, viewed from the immediate perspective, appeared to the Company more as a liability than as an asset because the southern-most part of the district not only comprised jungles and waste-land but was infested with wild animals and dacoits while the prevailing climate was the most unsuitable for human habitation. To the colonial government the most pressing need was then for deforesting the area, making it worth cultivation and human-settlement and for opening a source of revenue to the government.

The forest area, simply stated, was to be reclaimed. But difficulties bristled up early in the way as the policy of reclamation was sought to be implemented. When the British government decided to construct a railway in East Africa—a lunatic line as it was called—from the East African coast to Lake Victoria in the last quarter of the 19th century, so many obstacles bristled up in the way—the inhospitality of the road, abundance of dangerous tsetse flies, prevalence of malaria, dysentery, scurvy, jiggers, above all, the terror caused by the man-eating lions of Tsavo—but the Government proceeded with the construction work undaunted in the teeth of such obstacles and completed the work of such stupendous magnitude

in a short time between 1899 and 1903. [1] So was the Colonial Government here determined to pursue the policy of reclaiming the forest area in the teeth of whatever obstacles or difficulties stood in the way. But what were the obstacles and difficulties ? J. Westland, the 19th century Magistrate and Collector of Jessore, described the following difficulties and obstacles attending the reclamation work in his 'A Report on the district of Jessore,' 2nd edition, 1874, pages 177-180 :

'The clearing of the Sundarban forest is a most arduous undertaking. The trees intertwine with each other to such an extent that each supports and upholds the others. Some of these trees, too, are of immense size—one sort, the jin tree, spreading and sending down new stems till it covers perhaps an acre of ground. Trees like these cannot be cut down and removed in bulk; they must be taken piecemeal and the tree must be cut into little pieces. But the trees are not the only difficulty, for there is a low and almost impenetrable brushwood which covers the whole surface. This has simply to be hacked away bit by bit by any one who attempts to penetrate into the forest. And there is no small danger from wild animals. Crocodiles are seldom met with, except on the immediate banks of rivers, but tigers are not infrequently met with and they occasionally attack the defenceless forest-clearers, if the latter approach their lair too closely. Sometimes a tiger takes possession of a tract of land and commits fearful havoc there. The depredations of some unusually fierce tiger or tigers, again, often compel an advanced colony of cleaners to abandon, through fear, their land which they reclaimed after years of labour. A deforested land springs back into jungle to become as bad as ever unless the greatest care be taken of the land so cleared. So great is the evil fertility of the soil that the reclaimed land neglected for a single year will present to the next year's cultivator a forest of reeds (nal). He may cut it and burn it down but it springs up again almost as thick as ever; and it takes about three eradications to expel this reed when once it has grown. The soil too must be cultivated for 10 or 12 years before it loses this tendency to at once cover itself with reed-jungle'.

Two other obstacles to the reclamation, not covered by the West land Report, were non-availability of drinkable water and want of a sufficient number of raiyats who could be induced to migrate and settle down. Illustrating such obstacles, the officiating Collector,

24-Parganas, A. W. Paul, wrote to the Director-General of Statistics, W. W. Hunter, in 1885: ' I know of one case in which about 5,000 bighas of land were cleared at Helancha but the cleared tract relapsed into jungle because of want of sweet water for the requirement of the people settling down.'

Such dissuading factors notwithstanding, the colonial government remained committed to the policy of reclamation. Reclamation and cultivation were pursued with the help of migrants from Midnapur, Cuttuck, and Chhotanagpur. These migrants generally came to the tract on the advent of the rainy season and lingered there either as labourers under the local cultivators or as cultivators themselves, cultivating land on temporary leases, and returned to their homes after the transplantation had been finished, one or two of them staying back to keep watch over their fields. The people came back in the harvesting season to remain till harvesting was over. Those who cultivated the land were never permitted to take home the crops while a farthing of the Sundarban Zamindar's demand remained unsatisfied. The migrants who settled in Patitabad area (reclaimed area) were more numerous than those who settled in the Sundarbans proper. (2)

Reclamation proceeded through different stages and under the leadership of different colonial officers. Tradition, however, ascribes the early attempt at reclamation to one Muhamedan adventurer, Khan Jahan or Khanja Ali, who was probably a punkha-burdar (fan-bearer) of Nazir Shah, an independent Pathan king of Bengal who reigned from 1426 to 1457 AD. (2A)

A stranger in Jessore, as written in the inscription on his tomb, he,however, managed to obtain a jagir in Jessore from the King of Gaur and exercised all the rights of sovereignty till his death in 1459. He set up his abode at Pargana Haveli Khalifateabad, some 20 miles north of Tantibunia (Khulna). As stated by Westland in his 'Report on the district of Jessore (p. 20)', 'tradition represents him as entering Jessore and marching through the district with a large body of men, making road as he went along, building mosques, and digging tanks here and there. The Senhati people say that he brought along with him sixty thousand diggers.' The prevailing belief of the inhabitants of Jessore-Khulna was that he came to reclaim and cultivate the lands in the Sundarbans which were at that time waste and covered with forest.

The ruins and remains of Khan Jahan Ali's works are to be found in various parts of the Sundarbans, even so far south as ' Jhalmaler Dighi' in village Hoorkha, 6 miles, north of Tantibunia (Khulna). Besides, a silted-up tank about 6 acres in area in Dattarmat, several brick walls embedded in the earth, other smaller tanks in Dhalirkhand in Tantibunia may also be mentioned here as the remains of Khan Jahan's achievements as an early reclaimer of the Sundarbans .[3]

When Khan Jahan died in 1459, his work also died with him. The area he had reclaimed relapsed into jungle, to be reclaimed again at a later date. When the jungle spread over the country again, as Westland holds, most of the tradition associated with Khan Jahan's life as a reclaimer was buried in it and 'the new inhabitants, when they came, picked up and preserved only those fragments (of tradition) which were thrust in their way.'[4]

The first official attempt to reclaim the forest area was made in 1770 by Claude Russell, Collector-General in the district of 24-Parganas. He granted rent-free leases to the lessees for an initial period until they made some progress in cultivation. He fixed an ultimate rate of about Rs. 1-8 per acre on all the lands that might be found reclaimed. Such lands were called Patit-abadi or taluks for the reclamation of wasteland. Considerable progress in the reclamation work was made by the lessees. Even the neighbouring zamindars took interest in promoting cultivation on the land cleared of forest.

The neat effort was made by Tilman Henckell, judge and Magistrate of Murli, Jessore (1781). Under the rule of the Muhamedans, the forest was regarded as belonging to the State and not as being included in any zamindari. This view was adopted by the early British administrators and the first systematic attempt to bring the forest under State cultivation was made in accordance with the plan proposed by Henckell to the then Governor-General of India, Warren Hastings, on 20 December 1783. Henckell's plan was to grant small plots of land, on favourable terms, to the people undertaking to reclaim them for cultivation. The land would be held by the people directly under the government. The terms were these: [5] The grantee or talukdar was to retain 200 bighas or 66 acres of land for himself. On the rest of the plot, he would be required to pay revenue to government according to the area he brought under cultivation. The revenue for the first 3 years would be nil:

for the 4th year, 9 d per acre (2 annas sicca per bigha), for the 5th year 1s. 6d. per acre (4 annas per bigha), for the 6th year 2s.3d. per acre (6 annas per bigha) and for the 7th and succeeding years 3s.5d. per acre (8 annas per bigha) . It does not appear to have been stipulated that the grantee was bound to bring under cultivation any specified area within a fixed time. Any way, he aimed at introducing a body of peasant—proprietors holding land directly under government. Henckell's plan was approved by the Board of Revenue and speedily brought under operation. He was made 'Superintendent for cultivating the Sundarbans.' He argued in favour of his plan on two main grounds—1st, it would earn revenue from the lands which were initially totally unproductive and 2nd, cultivation 'would, by its peculiar nature, form a grand reservoir of rice against seasons of drought or famine. Henckell also held that his plan, if implemented, would also free the area from the menace of dacoits and would facilitate the manufacture of salt. Henckell looked upon his plan as a great success and reported that many zamindars had come forward and taken grants and that 7,000 acres or 21,000 bighas were already under cultivation. Henckell took immense interest in the execution of his plan and even personally advanced money to the talukdars to carry it out. He also set up 3 markets for the sale of produce and for the supply of provisions to boatmen plying along the waterways — one at Henckellganj (now called Hingulganj) at the junction of the Jamuna and the Kalindi, and the two others at Kachua and Chandkhali in Khulna.

But difficulties arose out of the disputes with the local zamindars who possessed land adjoining the grants made by Henckell, and in many cases staked their claim to such grants. To end the resultant confusion Henckell marked off the boundary between the zamindars' lands and the government grants in August 1786 by bamboo stakes. The boundary line came to be known as Henckell's 'bansgari.' (6) The boundary, however, was not easy to determine. The zamindars held their lands not by specific boundaries but by parganas. Whenever any land was brought under cultivation, they claimed to attach the newly cultivated land to the adjacent pargana lying within their limits. The Selimabad zamindars specially interfered with the cultivation and forcibly apposed the talukdars. Henckell repeatedly urged the Board's interference in favour of the talukdars and wished an order to be issued to the zamindars that they should declare

their boundaries within 3 months but in vain. The unsettled state of affairs struck a death-blow at the Henckell schemes. The talukdars paid their revenue for some time in the hope of having the matters settled but being disappointed, stopped the payment and fell into arrears.

Meanwhile, Board's attention was drawn by Henckell to the following grants made between 1785 and 1789 : In 1785–21,000 Bighas, 1787–13,094 Bighas, 1788–8113 Bighas, 1789–1603 Bighas. (7) The number of grants made in the subsequent years were smaller on account of the disputes with the local zamindars.

Henckell also brought to the notice of the Board the prospects of revenues from the grants made. For instance, the demand of revenue for 1788 was £261–10–0d, and by 1793 a demand of £2054 was expected on the grants already made. (8) According to Pargiter, Henckell conjectured that government would derive a revenue of Rs 7½ lakhs in 7 years. The Board was not, however, convinced by such facts and figures. It had already withdrawn, on the score of expenses, the establishments which had been placed in the 3 markets of Henckellganj, Kachua, and Chandkhali to promote and manage the system of grants. The present expenditure and the certainty of litigation with the zamindars weighed with the Board more than the chances of future revenue. In such circumstances, the Board practically abandoned the Henckell scheme.

A belt of the Sundarbans land about 20 miles wide had been reclaimed from forest and brought under cultivation since the time Henckell established his outposts at Henckellganj, Kochua, and Chandkhali.(9)

In 1793, Permanent Settlement came into operation but the private landholdings bordering on the sundarbans forests had no constant boundary on the forest side. This gave excuses to the private landlords to encroach on forest land, though the forest was declared a State property . In 1817, the Board of Revenue realized that the neighbouring landlords were collecting unauthorized taxes of considerable amount from the forest area. To put a stop to such a practice the government decided to continue the policy of speedy reclamation of the Forest area and the distribution of reclaimed land among talukdars, raiyats, etc.

True to the policy of Government was created the post of a Commissioner in the Sundarbans in 1816 by Regulation IX of the

year. D. Scott was appointed the first Commissioner. Enquiries under his direction established that neighbouring private landholders had encroached beyond their permanently-settled estates and that new lands brought under cultivation were held by them without payment of any revenue to the State. The Commissioner immediately addressed himself to the task of preventing such encroachments. He also declared the Sundarbans as the State property by enacting Regulation XXIII of 1817 and asserted the right of government to collect revenue from the reclaimed land. He lost no time in resuming and settling all encroached lands. Scott's activities seemed to ensure steady progress in reclamation and settlement.

In 1821, the Sundarbans office was reconstituted under Mr. Dale and was reinforced by a Survey Party under Ensign Prinsep 'with the wider object of demarcating the state-lands from private estates'. As demarcation was taken in hand, the Zamindars held that there were no State lands at all, for they laid claim to the entire forest area that abutted on their estates down to the sea-coast. The only course left open to government, in such circumstances, was to survey all the lands that had been brought under cultivation during the previous 30 years. And that was done. In 1822 and 1823, Prinsep surveyed the line of forest from the river Jamuna to the Hooghly, and with the aid of Morrieson's map divided all the forest lines between those rivers into blocks and numbered them. This marked the beginning of the Sundarbans Lots.

The State now claimed revenue both from the forest and the recently reclaimed lands. But resumption (or the establishment of the right of the State to demand revenue from lands that paid no revenue previously) was no easy affair on account of the intricacy of the claims, paucity of trustworthy documents, and fabrication of records. But the exertions of such officers as Dale, R. D. Angles, John Lewis, and others, overcame the difficulties. By 1828 the State had recovered all the lands that had been surreptitiously encroached upon. That year witnessed a final declaration of the rights of the State over the recently cultivated land and forest area, in the form of Regulation III (1828). In this Regulation, briefly referred to in chapter I, it was laid down that 'the inhabited tract known by the name of the Sundarbans has ever been, and hereby declared still to be, the property of the State; the same not having been alienated or

assigned to Zamindars or included in any way in the arrangements of the Permanent Settlements. The Governor-General-in-council shall, therefore, be competent to make, as heretofore, grants, assignments, and leases of any part of the said Sundarbans and to take such measures for the clearance and cultivation of the tract as he may deem proper and expedient. '[10] It was further enacted that the boundary of the Sundarbans forest should be determined by the Sundarbans Commissioner and laid down by an accurate survey. William Dampier was now appointed Commissioner and Lt. Hodges, the Surveyor. His own surveys and those of his predecessor, Prinsep, enabled Hodges to prepare a map of the entire Sundarbans area in 1831 which has been 'the standard map of the Sundarbans ever since'. He divided the entire forest into 236 blocks, the aggregate area of which was computed at 1,70,24,20 acres or 2,660 sq miles. [11] The northern boundary of the Forest region was also determined by what is called the Dampier-Hodges line in 1831, already referred to in chapter I.

Now that the boundary of the forest area was formally determined, as desired by Government, it became a salient item on the Sundarbans agenda to deal with the lands reclaimed but held free of revenue. Accordingly, as fast as each estate was resumed, it was brought under settlement and the resultant increase of revenue was computed roughtly at about 2½ or 3 lakhs of rupees up to about 1844.[12]

Another important item on the government's Sundarbans agenda was seriously to follow-up the already announced policy of making grants of land with a view to their being cleared and made fit for agriculture and habitation.

It was not till 1830, however, that a significant step was taken in this direction. As the rules for the grant of lands were issued, applications poured in mostly from European residents in Calcutta. Grants were made in perpetuity at a rental of about Rs. 1–8 per acre, and nothing was payable during the first 20 years. But it was stipulated that 1/4 of the area granted should be rendered fit for cultivation within 5 years, failing which government would forfeit the land grant. Between 1830 and 1831, 98 lots were allotted and 12 more during the next 5 years, with a total area of 551,520 acres. [13] Among the principal granties (European and native) were Messrs. Kerr, Sturmer, Hently, Storm, Rogers, Campell, Fergusson, Brac, Pigeon, Radha Krishna Dutt, Guruprasad Chowdhury, and Hafizuddin.[14]

But the grantees failed to abide by the terms of the grant. The stipulation that 1/4 th of the granted area should be brought under cultivation within 5 years proved too onerous for the grantees and most of the leases were forfeited on account of their failure to comply with the terms. Moreover, few grantees had sufficient capital at their command. The work of reclamation, again, required unceasing care and vigilance. It was liable to be interrupted any moment by the desertion of the raiyats, and fresh hands had to be engaged at a heavy expense. Moreover, if an embankment chanced to be breached, salt water poured in, making the soil unfit for cultivation due to a deposit of salt. The grantees were not so much mindful of their responsibility. The stipulated portion of lands was not brought under cultivation within the stipulated time, with the result that the grants lapsed and new rules had to be framed.

The new rules were published in 1853: (1) Grants were to be made for 99 years and sold to the highest bidder if there was competition. (2) The revenue assessed on the grants was reduced to about 6 annas per acre and did not become payable till the 51st year after a long and very gradual enhancement commencing from the 21st year. (3) Reclamation was more carefully provided for, the grantee being required to have 1/8th of the grant fit for cultivation in the 5th year. 1/4th in 10, ½ in 20, and practically, the whole in 30 years on pain of forfeiture. The earlier grantees were allowed the option of giving up their old leases and taking up fresh ones under the new rules. The new rules gave a fresh stimulus to the reclamation-work but in spite of the greater liberality of the conditions regarding the clearance of forest about 70 grants were forfeited.

That the government now paid serious attention to reclamation was thus fairly established. A few years later or after the Sepoy Mutiny (1857), Government placed two proposals before the public for the disposal of waste-lands generally : one was to sell the waste-lands outright, the purchaser being discharged from all prospective demand on account of land-revenue; and the other was to allow the land-owners to redeem their existing land-revenue by immediately paying it off once for all by one capitalized sum equal in value to the revenue redeemed. These measures were generally advocated with the object of promoting the settlement of the Europeans in India, and after much discussion rules, called Waste Land Rules were promulgated in October 1863, embodying these views. Some

13 lots were sold under these rules in 1865 and 1866 but many purchasers were either indifferent or unable to pay the purchase-money even by instalments during 10 years. The rules for the redemption of land-revenue, however, met with more success and were taken advantage of in some 20 lots.

The 1863 measures were found fault with on the ground that the upshot price was exceessive and that only the capitalists could take advantage of them. Applicants for land, therefore, preferred the grant-rules of 1853. But no definite change was made, for F. Schiller's ambitious scheme of the Sundarbans reclamation was then before the public.[14]

F. Schiller and 8 other gentlemen, European and Indian, applied to Government in 1865 for the purchase of all the remaining ungranted waste lands, proposing to raise a capital of not less than one million sterling and to reclaim the lands by means of labour imported from China, Madras, Zanzibar, and other countries. Though prepared to sanction this ambitious scheme, Government declined to countenance any proposal to import labour from Africa. Schillar then attempted to start a Company with a capital of nearly 2 million sterling and continued his efforts for 3 years but failed to induce the public to join his Company. So much money had been wasted in reclaiming the Sundarbans that the public had grown cautious. Schiller's efforts proved unsuccessful and his scheme fell through in 1868.

Government had still kept in view the problem of the settlement of Waste lands after the failure of Schiller's scheme. A new set of rules were accordingly promulgated in 1879. The Rules of 1879 provided for two kinds of grants—namely (1) blocks of land not exceeding 200 acres leased to small settlers and (2) blocks of 200 acres or more leased to larger capitalists who were prepared to spend money and devote time to the development of the grants. Between 1879 and 1904, when the Rules were suspended, grants or leases were made of 1223 sq miles out of an available area of 2301 sq miles. [15] As regards the small capitalist rules, the small settlers were guaranteed a lease for 30 years if the lands were brought under cultivation within 2 years. They were allowed a rent-free term of 2 years after which progressive rates of rent were fixed on the cultivated area, with reference to the rates paid in the neighbourhood by raiyats to the landlords for similar lands. The holding was liable

to measurement every 5 years, and all cultivated land in excess of the area originally granted would be assessed at the same time. After 30 years, renewed leases could be given for 30-year periods, the rates of assessment being adjustable at each renewal to the rates prevailing in the neighbourhood. No charge was made for the wood and timber on the grant but a duty was to be levied on any thing exported for sale.

As regards the large capitalist rules, the maximum area of grants was limited to 5,000 bighas, the minimum being 200 ones. The period of the original lease was fixed at 40 years and after its expiry resettlements were to be made for 30-year periods, the maximum rates being laid down for each resettlement. One-fourth of the area was exempted from assessment in perpetuity and the remainder was held free of assessment for 10 years. 1/8th of the entire area must be rendered fit for cultivation by the end of the 5th year. 'This condition was enforced either by forfeiture of the lease or by the issue of a fresh lease,omitting the remainder of the rent-free period and requiring payment of rent at enhanced rates.' The rules also provided for gradually increasing rates of rent after the expiration of the rent-free period and for varying rates within different tracts according to the rent-paying capabilities of the land. No charge was made for timber on the land but a duty was levied on anything exported for sale.

The rules of 1879 were, however, liable to abuse. In the capitalist system, the actual cultivators were assessed, while the rack-rented, land-jobbers, and speculators obtained leases under the scheme for reselling them as a profit. To recoup their outlay on reclamation the original lessees often sublet these to smaller lessees in return for cash payment, and the same process was carried down lower in the chain, with the result that land was actually reclaimed and cultivated by peasant-cultivators paying rack-rents.

It was, therefore, decided in 1904 to abandon the system of making grants to the large capitalists and to introduce Raiyatwari settlements on an experimental basis, small areas (maximum 75 bighas and minimum 10 bighas) being let out to actual cultivators whom Government assisted by making advances, constructing tanks and embankments, and by clearing jungles. The experiment proved successful in Backarganj but failed in the 24-Parganas.[16] The Raiyatwari rules were suspended in 1904. Reclamation proved very

expensive and cultivators could not be settled on remunerative terms.

A special set of rules was promulgated in 1897 for the settlement of land on the Sagar Island. The new rules for the Sagar Island were based on the above-mentioned Large Capitalist Rules of 1879 with certain special points of difference. The maximum area was fixed at 10,000 bighas out of consideration of the fact that extensive protective works had to be undertaken and that only men of means should be encouraged to take leases; the rent-free period was raised from 10 to 15 years and the rates of rents substantially liberalized; the period of settlement was fixed at 20 years; besides, the rules contained certain important provisions for the maintenance of protective works.

In 1903, a Committee was appointed by Government to consider the whole question of the form of the lease to be adopted in future. The Committee decided to abolish the system of leases to capitalists, large or small, and to proceed by direct settlement with the cultivating raiyats. NewRaiyatwari settlement rules were then made in 1905 but they remained ineffective in the 24-Parganas after an abortive and financially unsuccessful attempt to colonize Frezerganj.

According to the Report of the Sundarbans Development Committee, 1950, the next and 'final' step was taken in 1915 when it was decided to permit further reclamation of the Sundarbans under the Raiyatwari system of settlement only, which had already proved a success in the Backarganj district. Further lots were accordingly reclaimed under what are known as Colonization Rules, the settlement being made direct with the cultivating tenants under the Khas Mahal management of Government. 'These rules are still in force, theRaiyatwari settlement being now ordinarily the sole means of reclamation in the whole of the Sundarban area.' (17)

The same Report (pages 9-10) presents the following facts relevant to the present discussion : 'There are 384 estates in the Sundarbans excluding those under Khas Mahal management. Of these, as many as 188 are grants under the Rules of 1879, the next largest group of 97 being grants under the Rules of 1853. The other types of leases still current are grants under the Sagar Island Rules of 1897, redeemed or revenue-free grants, resumed estates temporarily settled with proprietors, and a few grants under special terms of lease. There are 12 grants settled in perpetuity. The num-

ber of Khas Mahal estates in the colonization area is 40. The total area of the grants is about 1430 sq miles and the total demand of revenue and cess payable by them are Rs. 9·33 and 2·16 lakhs respectively. The Colonization of Khas Mahal area is 28·19 sq. miles. The revenue and cess demand from Khas Mahal estates are Rs. 1 lakh and Rs. 3,000 (three thousand) respectively.'

'The holders of the Sundarban grants are proprietors or tenure-holders, according to the different types of leases under which these grants have been made. The lessees who are known as lotdars have in a number of cases sub-let their lands to the people known as Chakdars of whom the total number is 8,226 at present (1950). The Chakdars have further sub-let to raiyats and, in some cases, raiyats have sub-let their lands again to under-raiyats. The number of raiyats tenancies is 1·65 lakhs, that of under-raiyats, 36,485.'

'The above structure of landed-interests in the Sundarbans does not, however, take into account bargadars, also known as bhagchasis, who are share-croppers, and the class of land-less labourers. These are the mainstay of agricultural operations but do not possess any legally recognized rights in the lands on which they work. No estimate is available of their number but competent observers acquainted with local conditions believe that they constitute 30 to 50 p.c. of the total number of agriculturists in the area, that is about half the number of the recorded raiyats and under-raiyats. Their number is also stated to be on the increase in recent times. A large proportion of the landless agricultural labourers is migratory in character and is brought in from the outside, particularly from the Midnapur district, during the agricultural season.

As noticed earlier, 'final step' in the matter of reclamation was taken in 1915. But modern researches are not in agreement to this view. According to a modern research, [18] reclamation was 'very extensive during 1873-1939, particularly in the northern and south-western sectors.' In this connection it is stated further : ' In 1873-1973 period, fresh reclamation covered the whole of Sandeshkhali and Kakdwip, the residual portions of Canning and Sagar Police Stations. Greater parts of Namkhana, Patharpratima, and Basanti and large areas of Mathurapur, Kultali, Gosaba, and Hingulganj Police Stations were also covered. In this vast reclaimed tract many lots were not cultivated though required under agreement, with the result that such areas reverted to the reserved forest and now appear

in the topographical sheets as reserved (forest) pockets.' Settlement on the reclaimed lands was largely facilitated by laying railway lines and opening steamer-routes were gradually extended deep into the forest-belt, linking such river-ports as Kakdwip, Namkhana, Sandeshkhali, Canning, Gosaba, Hingulganj and Taki. ....Between 1945 and 1951, the forest-pockets were eliminated and there had been only additional marginal reclamation in some sectors, for example, Hingulganj, Gosaba, Basanti, Kultali, Mathurapur, Patharpratima, and Namkhana Police Stations. In 1951-71, a few small pockets were reclaimed primarily for refugee rehabilitation in the Police Stations of Hingulganj (Southern part), Gosaba (southern part and Satjelia), Basanti (Jharkhala area), Kultali (South), Patharpratima (northern part of Dhanchi), Namkhana (Bakkhali), and Sagar (Central marshes in Towerland). After 1971 there has not been any official reclamation.'

Mention may be made here of the activities of two Companies and of certain zamindars and private persons in connection with reclamation. Port Canning Company and Messrs. Mackinnon and Company were the two Companies that reclaimed a considerable area of the Sundarbans tracts. Some among the zamindars and private individuals connected with reclamation were the Nag-Chaudhuries of Arbalia, the 'Babus' of Taki, the Ghoses of Sripur, Babu Asutosh Dhar, a pleader of Calcutta High Court. [19]

Three different types of lands-settlement emerged in the course of the reclamation — (a) Resumed, mahals (b) Forest grants, and (c) Alluvial accretions. (a) Resumed mahal referred to the areas that had been brought under cultivation before Permanent Settlement, ordinarily by the neighbouring zamindars without the authority of government. As a matter fact, large areas of forest subsequently cleared were frequently included in these estates. Government did not avail itself of the right of dispossession but exercised the right of resumption; the zamindar's claim was ordinarily ignored and settlement was made with abadkar, ordinarily a substantial middleman who acquired the right of a permanent tenure-holder holding land at a variable rent. These resumptions were completed by Messrs. Dampier and Grant before 1836, settlement being made for a term of 20 years. (b) Forest grants were based on leases specifically given by government for the purpose of reclaiming forest and bringing it under cultivation. The important rules

that governed these grants were those of 1817, 1830, 1853, and 1863. (c) In Backarganj, the area due to alluvion, subsequent to 1793, was estimated at 87 sq. miles. In Khulna, and 24-Parganas, where the seaward extension of the delta is less pronounced, the excess area must be considerably less. The most noticeable alluvial formations are Char Kukri-Mukri, Char Hare, and Char Biswas in Backarganj. (20)

Revenue Policy of Government

If the revenue history of the 16th century Bengal began under the stewardship of Akbar's Finance Minister,Toder Mall, his Rent Roll, completed in 1582 AD, made no mention of the Sundarbans terrain, described as Murad Khanah or Jerad Khanah, as an assessed territory. It was not till the regime of Aurangzeb's brother, Shuja, Governor-Subahdar of Bengal, that the so-called Sundarbans were first assessed to revenue a short time before 1658, as already noticed in the preceding chapter.

Under the early British Colonial administration, Bengal was subjected to the dual policy of reclamation and revenue collection. The method employed was to encourage reclamation by granting long-term leases of land at low rents, with the additional incentive of allowing a considerable portion of the lease-period to be exempted from assessment. Many were the experiments made from 1770 onwards for a smooth and expeditious reclamation work and revenue collection by allowing the lessees rental concessions and long periods of exemption from payment, as would be borne out by the story of reclamation unfolded above. 'The Revenue history of the Sundarbans by F. E. Pargiter, Commissioner in the Sundarbans in 1885, is a valuable source of information about reclamation and revenue assessment during the period of study from 1765 to 1870. The period dealt with by him was one of great complexity. Commencing with the original reclamation proposals, the study 'covers a period of great experiments, largely failures, it is true, which culminated in the rules of 1853. These rules bequeathed to future revenue officers difficulties and intricacies unknown in other parts of Bengal.' His history contains ' an extraordinary mass of details' but critics opine that 'this immense amount of details has tended to obscure the principles involved.'

Pargiter was appointed the Commissioner in the Sundarbans in 1885 with all the duties, powers, and authority of a collector of Land-Revenue. This unity in administrative control over the entire Sundarbans area, though a factor of great importance in the development of the region, was not possible in practice to be enforced because of the lack of homogeneity between different tracts of the Sundarbans, the existence of different forms of leases and settlement over the whole area. Three different types of settlement had then been in existence—Resumed Mahals, Forest Grants, and alluvial Accretions, as stated above. So, in 1844 the office of the Commissioner was abolished and his duties of revenue-collection etc. were assigned to the district-collectors. Thus was abandoned unity of control so long in the hands of the Sundarbans Commissioner, with the result that different requirements of each district— 24-Parganas, Khulna, and Backarganj — were now recognized, and 'agricultural and revenue experiments were tempered by physical and hydrographical problems.'

Pargiter's work was continued by F. D. Ascoli in his ' Revenue history from 1870 to 1920.' [21] Up to 1870 the rules of 1853 and 1863 resulted in little additional reclamation. The area leased up to 1870, namely 946 sq. miles with an ultimate revenue of Rs. 1,77,458, had by 1880 decreased to 787 sq. miles with an ultimate revenue of Rs. 1,45,880. (Ascoli, p. 11) This decline was due to the government policy of forest-reclamation to the neglect of forest conservation. As late as 1853, as held by Ascoli, Government's paramount policy was the speedy reclamation of forest in order to improve the health of the Calcuttans, to deprive the wild animals, smugglers, and pirates of the shelter offered by jungles, but improvement of revenue was relegated to secondary or subordinate importance. Hence no attempt had been made to conserve the forest or to derive revenue from forest produce. Accordingly, the advisability of conserving the forests of Bengal was considered in 1862 on the basis of a memorandum prepared by Dr. Brandis, Conservator of Forests in Burma. According to Ascoli, therefore, Government policy should be to increase revenue from forest produce, by conserving, not reclaiming, forests. In 1864, the total area of government forests in the Sundarbans was returned at 3,403 sq. miles. Practically the whole area was leased out to the Port Canning Company but in 1868 Government again decided in favour of reclaiming the

forest area. Leases for the collection of dues on forest produce were cancelled.

In 1869-70, the Forest Department again proposed to reserve forest for revenue purpose but the proposal was negatived by the Lt. Governor, Sir William Gray. In 1872-73 a revised scheme was prepared by Mr. Home, Deputy Conservator and Dr. Schlich, Conservator of Forests. The scheme aimed not so much at the conservation of forests as at regulating exports of forest produce. It promised a net revenue of 1½ lakhs of rupees by the institution of a number of preventive stations and peripatetic petrol boats for the purpose of collecting tax on the export of forest produce. Government did not give its consent to the scheme as it apprehended that it would cause great embarassment to the people. But the Forest Department was undaunted and sought to convince the Government that forests, if reserved, would yield immense income as the forests were extremely rich, in fact, inexhaustible. In reality, however, forests were not inexhaustible in supply. Moreover, the interior of forests being marshy, transport was impossible for the collection of forest produce. Thus ill-advised though, government had no alternative but to declare Sundri forests in the Bagerhat (500 sq. miles) and Khulna (385 sq. miles) sub-divisions reserved in 1875.

It thus appears that the revenue policy of the Forest Department was to get the forests declared as reserved and then to realize revenue from forest-produce, whereas the government's revenue policy was to reclaim forests for settlement and farm-land and then to realize revenue from agricultural produce.

Encouraged by government's declaration on the reservation of forests, Dr. Schlich recommended in 1876 that the entire unleased area in the Sundarbans be placed under Forest Department. Government agreed to include in the reserved area an additional 314 sq. miles in Khulna and 382 sq. miles in the Satkhira sub-division (then in 24-Parganas) (Ascoli, 57). Again, as proposed by the Forest Department in 1879, an area of 1851 sq. miles in Basirhat, Diamond Harbour, and Baruipur sub-divisions of the 24-Parganas, 24 sq. miles in the Satkhira sub-division, and 50 sq. miles in Khulna were declared as protected forest (Ascoli, 58).

By 1880-81, the annual revenue derived from the Reserved and Protected forests amounted to Rs. 2,79,409 at the expenditure of Rs. 65,251 (Ascoli, p. 58).

In the next decade (1881-91), some of the Reserved and Protected Forest areas were deforested and reclaimed in Bagerhat, Khulna, Diamond Harbour, and Basirhat. By 1900-1901, the total area of Reserved forest — all in Khulna district — was returned at 2,092 sq. miles (Ascoli, 59). The area of Protected Forests, always a fluctuating figure, had increased, despite the extension of reclamation, to 1923 sq. miles, all in the 24-Parganas (Ascoli, 59). The state of the Sundarbans forest, as in 1901-11, will be evident from the following table (Ascoli, 60) :

District	Class of forest	Area in sq. miles	Total annual Revenue Rs.	Total annual expenditure Rs.
Khulna	Reserved	2,089	5, 44, 252	1, 70, 565
24-Parganas	Protected	1,711		
Backarganj	Protected	50		

The area of Reserved Forest had remained almost stationary while that of Protected Forest showed some decrease due to the reclamation policy. Subsequent to 1911, while the area of the Protected Forest remained unchanged, that of Reserved Forest was returned at 2,297 sq. miles, the increase of 208 sq. miles (2297-2089) being due to the rectification of errors in computation, revised in 1913 (Ascoli, p. 61). The gross income rose to 6 lakhs, fetching a net income of more than 4 lakhs of rupees to the State (Ascoli, 61). The income from Protected area amounted in 13 years ending in 1920 to Rs. 2, 68,778 (Ascoli, 61).

Forests (both Reserved and Protected) continued to be a lucrative source of revenue to Government from the sale of different types of forest-produce, as would be borne out by the following Tables :

TABLE - I

Revenue realized in rupees from different types of forest produce in different periods

Types of Produce	1875-76 to 1891-92	1892-93	1893-94 to 1902-03	1903-04 to 1909-10	1910-11	1911-12
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Timber— Sundri, Passur, Amur, Keora, Been, Dhundal Gengwa & Other kinds	1,17,931	2,42,558	2,70,739	1,86,971	2,32,676	1,48,875
2. Goran	13,988	included in avove figure	included in above figure	92,696	1,04,706	96,829
3. Fuel (Sundri & other kinds)	1,04,715	1,20,772	1,95,754	1,16,363	1,28,844	1,16,067
4. Minor produce (Golpatta, Honey, wax and other kinds)	51,760	57,405	79,698	91,845	1,21,448	1,02.,305
5. Misce-llaneous revenue	15,104	14,633	11,538	14,150	12,253	10,837
6. Total Revenue	3,03,498	4,35,368	5,57,729	5,02,025	5,99, 927	4,74,913

Source : Working plan for the Revenue realized from forests of the Sundarbans from different types of forest produce - vol.- I by S. J. Curtis, Deputy Conservator of Forests, 1933, pp. 66-67.

TABLE - I (Contd.)

Revenue realized in rupees from different types of forest produce in different periods

Types of Produce	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Timber— Sundri, Passur Amur, Keora, Baen Dhundal,Gengwa & other kinds.	2,17,474	3,24,250	2,32,794	1,20,163	1,83,452	1,99,609
2. Goran	1,02,138	1,16,582	1,08,499	85,250	1,19,667	1,15,640
3. Fuel (Sundri & other kinds)	1,30,490	1,20,282	1,01,497	88,346	94,049	76,267
4. Minor produce (Golpatta, Honey, wax and other kinds)	1,21,787	1,69,309	1,68,498	1,46,255	1,59,288	1,73,605
5. Miscellaneous revenue	11,521	19,085	12,873	10,749	13,629	13,395
6. Total Revenue	5,83,410	7,49,516	6,24,161	4,50,763	5,70, 085	5,78,516

Source : Working plan for the Revenue realized from forests of the Sundarbans from different types of forest produce - vol. I by S. J. Curtis, Deputy Conservator of Forests, 1933, pp. 66-67.

TABLE - I (Contd.)

Revenue realized in rupees from different types of forest produce in different periods

Types of Produce	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Timber— Sundri, Passur Amur, Keora, Bean Dhundal, Gengwa & other kinds.	2,69,252	2,96,437	3,82,498	1,85,581	2,95,157	3,00,672
2. Goran	1,50,214	1,25,276	1,52,347	1,43,707	1,45,744	1,58,584
3. Fuel (Sundri & other kinds)	80,829	65,810	65,547	62,112	47,931	46,737
4. Minor produce (Golpatta, Honey, wax and other kinds)	1,74,685	1,96,279	1,61,100	1,49,667	1,79,707	2,21,032
5. Miscellaneous revenue	22,412	14,427	14,316	13,846	31,382	23,890
6. Total Revenue	6,97,392	6,98,229	7,75,808	5,54,913	6,99, 921	7,50,915

Source : Working plan for the Revenue realized from for ests of the Sundarbans from different types of forest produce - vol. I by S. J. Curtis, Deputy Conservatorof Forests, 1933, pp. 66-67.

TABLE - I (Contd.)

Revenue realized in rupees from different types of forest produce in different periods

Types of Produce	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Timber— Sundri, Passure Amur, Keora, Baen Dhundal, Gengwa & other kinds.	4,01,187	5,40,504	5,15,542	4,41,224	4,07,733	4,10,411
2. Goran	1,67,212	1,52,541	1,57,113	1,79,957	1,52,971	1,67,504
3. Fuel (Sundri & other kinds)	56,059	56,553	60,946	59,880	65,079	63,091
4. Minor produce (Golpatta, Honey, wax and other kinds)	2,43,145	2,52,533	2,58,560	2,18,162	2,07,914	2,10,213
5. Miscellaneous revenue	29,217	31,606	37,820	45,552	45,506	47,347
6. Total Revenue	8,96,820	10,33,737	10,29,981	9,44,775	8,79,203	8,98,566

Source : Working plan for the Revenue realized from forests of the Sundarbans from different types of forest produce - vol. I by S. J. Curtis, Deputy Conservator of Forests, 1933, pp. 66-67.

TABLE - II

Revenue realized from Honey, Wax, and Fishery activities

Source : Forest Statistics of west Bengal, 1988, and 1990-91 (Planning and Statistical Cell (Statistics),Office of the Principal Chief Conservator of Forests, West Bengal).

Honey (1988-89)

Crude honey collected	...	57,885 kg.
Rate of collection cost per kg.	...	Rs. 14/-
Collection cost paid	...	Rs.8,10,390
Filtered honey sold	...	55, 772 kg.
Crude honey sold	...	10, 528 kg.
Revenue realized against sale of honey (upto January' 89)	...	Rs. 10,92,687

Wax (1988-89)

Crude wax collected	...	3,239 kg.
Rate of collection cost per kg.	...	Rs. 18/-
Collection cost paid	...	Rs.58,302
Wax sold (including old stock)	...	5,588 kg.
Revenue realized	...	Rs. 3, 36,080

Honey (1990-91)

Crude honey collected	...	148·29 quintals
Rate of collection cost per kg.	...	Rs. 20
Collection cost paid	...	Rs.2,96,580
No. of permits issued for collection of honey	...	40
No. of persons engaged in honey – collection	...	244
No. of honey – collectors killed by tigers	...	2
Revenue from sale of honey	...	Rs.3, 61,017

Wax (1990-91)

Crude wax collected	...	880 kg.
Rate of collection per kg.	...	Rs. 24
Collection cost paid	...	Rs. 21.120
Wax sold (including old stock)	...	6421 kg.
Revenue realized	...	Rs. 3.29.413

Fishery activities : (1990-91)

No. of registered fishing boats at present	...	5550
No. of permits issued for fishing	...	26.378
No. of persons engaged in each boat on average	...	4 persons per boat
Quantity of fish sold	...	34,679 kg.
Revenue realized	...	Rs.1.25,749

Though the Sundarbans forests are thus a potential source of income, they are, according to the report of IUCN Wetlands Programme, (The World Conservation Union, 1994, pages 167-), 'extremely degraded and, therefore, the growing stock and yield are also poor.' It is estimated that ' the mean annual increment for timber is 0·5 m/ha (million/hectair). 'Anthropogenic stress is evident all over the Sundarbans forest today. Xylocarpus and Sonneratia trees have been completely cleared from most of the peripheral mangrove blocks. Regeneration rates have remained unchanged in blocks worked under selection-cum-improvement felling. However, the area of saline blanks has increased and trees of high girth are scarce. Regeneration is poor outside the tidal inundation range. In the 24-Parganas Division, to the west of the river Matla, Harobhanga, Ajmalmari, and Dhulibhasani blocks are in degraded condition, Chulkati block is nearly degraded, although Thakuran, Saptamukhi, and Muriganga blocks are in a comparatively better[sic]state.' IUCN Report, Ibid. p. 167.

It is, however, significant to note that currently the forest Department has been paying attention to the future utilization of forest-resources. The National Forest Policy, as revised in 1988, was intended ' to ensure environmental stability, and the mainte-

nance of an ecological balance.' The policy 'advocates increasing the forest and tree-cover to 33 p.c. of the land-area and allows use of forest areas to meet requirements of rural and tribal population for fuelwood, fodder, and non-wood forest-products (NWFP) while industries, as far as possible, are expected to arrange for raw materials from farm forests. Policy stresses on increasing the productivity per unit area with regional and district support. Wherever possible non-government organization involvement has been advocated.'

'The draft Eighth Five Year Plan (1992-97) emphasizes investments for rehabilitation of degraded forests (10 million ha.) including farm forestry and the promotion of NWFP, (Non-Wood Forest Product) fuelwood, and fodder. It also supports forest and wild life management, research, extension, and training. The objectives for the management of forests have been identified as follows : (1) to work the existing forest with a view to improving the area, (2) to meet the local demand of small timber, fuel, and thatching materials, (3) to prevent soil denudation and erosion as far as posible, (4) to protect and improve the existing crops, (5) to afforest the degraded areas, (6) to protect the shore or coastal line, (7) to provide employment to the Scheduled caste and Scheduled Tribe as far as possible.'

'In the objectives prepared for the management of 24-Parganas Division in the Working Scheme for 1992-93 to 2001-2002, the policy of Government has been to manage the forests by the people. It has been intended to manage the degraded forests by formation of forest protection committee in collaboration with local village councils.'

Source : The IUCN (International Union for Conservation of Nature) Wetlands Programe. Mangroves of the Sundarbans vol.1 : India, by Amal B. Chaudhury and Amalesh Chaudhury. IUCN- The World Conservation Union, 1994, pages. 177, 179. Ibid.

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CHAPTER-IV

Economic structure — Agriculture, Fishery — Economic importance of the forests — Economic life of people — Economic development of Gosaba, Rangabelia. and Satjelia with the initiative of Sir Daniel Hamilton — Tebhaga agitation (1946-50).

Economy or economic structure of the Sundarbans area is built mainly on agriculture, fishery, and forest resources.

Agriculture is the mainstay of the economic life of the people, about 89 per cent of the total rural population of the region being dependent on agricultural economy(mainly mono-cropping) as against 57 per cent of the population of West Bengal. Such heavy dependence of the people on agriculture alone is indicative of their unbalanced economic life, a barometer of the poverty-level of the agricultural workers. About 50 per cent of the cultivators are landless and the percentage has been on the increase. (1)

The soil of the Sundarbans is responsive to intensive cultivation. The soil is alluvial which, if protected and treated adequately, is capable of bumper production. Soil of the region could be generally classified into five broad groups–clayed soil, heavy soil, sandy loam, sandy soil, and salty soil. If the alluvial soil is favourable to agriculture, salinity of water, brought in by the estuarine waterbodies, is harmful to it. Here surface water is saline which is unsuitable both for human consumption and agricultural purpose. The ground water is reached at a great depth, from 300 to 400 meters from the surface and its exploitation is, indeed, costly. To protect arable lands against the inflow of saline water from the estuarine rivers embankments (3,500 km. in length) have so far been built. Again, the Sundarbans' tidal rivers carry large bodies of sediments which do not raise the level of the delta-face because of the embankments but only raise the river-beds, aggravating thereby the drainage problem of the islands. Thus the embankments, which guard the cultivable lands against saline water and are intended to protect the region against inundation, also,paradoxically though, cause drainage problem, affecting the yield of paddy adversely. Above all, the

region is prone to storms and cyclones on the onset of the monsoon and also in the post-monsoon period. If the outbreak of the storm synchronizes with the high tides, as it did in 1976,1982, and in 1985, it spells disaster to embankments, causing crop-failure, valued at a few crores of rupees. (2)

The utilization of the reclaimed areas whether in the 24-Parganas or in Backarganj – Khulna – Jessore for agriculture was kept in view by the Colonial Government ever since it had given its seal of approval to the policy of reclamation. The reclaimed area was devoted mainly to paddy cultivation, the yield of paddy in the Sundarbans being higher than the average paddy- yield in the rest of Bengal. When land was cleared, according to the normal process followed, a bandh or dike was erected arround it to keep out salt water, and after two years, the land became fit for cultivation. In normal years, 'excellent crops were obtained, the outturn being usually about 20 maunds of rice per acre' in about 1909.(3) The paddy grown in the 24-Parganas and Backarganj Sundarbans was of a finer quality than that grown in Jessore. Two crops of rice were raised in a year — Aus (autumn crop) and Aman (winter crop) . Enamoured of the eye-soothing beauty of reclaimed paddy-fields in the Sundarbans, Westland (4) writes :'It is difficult to give idea of the wealth of rice-fields that one sees in passing during the harvest-time along the rivers which intersect the Sundarban reclamations. In other parts of the country, one's view is always restricted by trees or by villages but in these Sundarbans it is different. You look over the vast plain stretching for miles on each side, laden with golden grain; a homestead is dotted about here and there, and the course of the rivers is traced by fringes of low brushwood that grow upon their banks, but, with these exceptions, one sees in many places one unbroken sea of waving 'dhan' up to the point where the distant forest bounds the horizon.' Westland has also dwelt on the devastating effects of cyclones on such paddy-fields, all disappearing under water, in consequence. 'Liability to cyclones', he further writes in this connection, 'must put a practical limit to the extension of cultivation : for nearer one gets to the sea, the greater the danger; and more the forest is cleared, the smaller barriers placed between the cultivator and the devouring sea.' (5)

Cultivation in the wake of reclamation made much headway in the second half of the 19th century. Between 1830 and 1872, for

instance, 2,12,659 acres had been cleared of jungle in the 24-Parganas part of the Sundarbans and rendered fit for cultivation, 1,04,096 acres in Jessore; and 1,77,152 acres in Backarganj, making a total of 4,93,907 acres of reclaimed land dressed for cultivation. The total approximate area under cultivation was returned in 1873 at 6,95,733 acres,[6] recording a marked increase over the total between 1830 and 1872.

With the gradual increase of land under cultivation consequent on reclamation, percentage of the area cultivated to the total cultivable area stood at 83 in the 24-Parganas, and at 85 in Bakarganj, while the percentage of the unculturable area in both the cases remained the same, as stated by Rai Sahib Anil Chandra Lahiri in his Report for 1924-25. [7] In this connection, he has furnished statistics of lands cultivated, land cultivable but not cultivated, land uncultivable etc. in 9 Police stations of the Sundarbans, as shown below in a tabular form :

Police Stations	Area Cultivated	Area Cultivable but not cultivated	Area uncultivable	P.C. of Cultivated to total Cultivable Land	Total area in sq.miles
	Sq. miles/ P.C.	Sq . miles/ P.C.	Sq. miles/ P.C.		
Haroa	80·28— 66	15 ·81 — 13	24·95 — 21	82	121·04
Hasnabad	115·15 —74	8·85 — 6	41·44 — 20	93	165·44
Sandeshkhali	147·22 — 53	38·24 — 14	90·48 — 33	74	275·94
Kakdwip	119 ·88— 73	20·31 — 12	25·07 — 15	85	165·26
Kulpi	89·71— 83	7·23 — 7	11·03 — 10	91	107·97
Mathurapur	185·15 — 56	79·75 — 24	67·42 — 20	69	332·32
Sagar	54·47— 53	27·09 — 26	21·44 — 21	67	103·00
Canning	191·40 — 66	36·17 — 12	63·15 — 22	84	290·72
Jaynagar	156·17 — 69	26·17 — 12	42·18 —19	85	224·52

The area of the 24-Parganas Sundarbans is virtually under mono-cropping and grows a kharif paddy (Aman) crop in the main. According to the Project Report on the Sundarbans Development (July 1979), only around 6 thousand hectares of lands have irrigation facilities necessary for the second crop. Twice-cropped areas are, according to the Report of Rai Saheb A. C. Lahiri, located in the Police Stations of Haroa, Hasnabad, Sandeshkhali (Basirhat Subdivision),

Kakdwip, Kulpi, Mathurapur, Sagar (Diamond Harbour Sub-division), and of Canning, and Jaynagar (Sadar sub-division).

Besides rice (Aus and Aman), other crops grown include sugar-cane, jute, pulses, rape mustard. Cultivators also grow such crops for home consumption as peas, tobacco, onions, garlic, brinjals, pumpkins, cucumbers, 'kachu' and plantains.

Under the 'Growth Centre Programme' run by the Sundarbans Development Board since 1974-75, cultivation of Rabi crops receives much encouragement. The following Table shows the extent of Rabi cultivation from 1976-77 to 1978-79.[8]

Hectares

	1976-77	1977-78	1978-79
Wheat	73	211	640
Chillies	168	976	1664
Boro paddy	175	734	1021
Mung	87	458	812
Water melon	76	386	520
Vegetables	110	310	342
Sunflower	52	260	254
Til	x	121	254

Cultivators have also taken to the cultivation of such crops as potato, groundnut, masuri etc. to a lesser extent. The Growth Centre Programme, according to the Project Report, 'has thus demonstrated that it is possible to induce small and marginal farmers to take to Rabi cultivation by initially subsidizing their investment requirements in parts in the form of seeds, fertilizers, etc.

The Project Report further proposes to set up ten centres of oil-extraction units (Ghani) at Kakdwip, Namkhana, Raidighi, Jaynagar, and Canning, with a capacity of 2 tonnes per unit per annum. Each Ghani would provide employment to 3 persons for a period of 3 months in a year. The net profit per unit was estimated at Rs. 1,800 for the crushing period of 3 months.

The Project Report also reports on 7 Government farms in the Sundarbans area of Hingulganj, Minakhan, Manmathanagar,

Mathurapur, Jaynagar II, Kakdwip, and Sagar. Exploratory and adaptive research work on crop varieties and soils is done in some of these farms which are all under the State Government.

Finally, the Project Report has drawn attention to a serious shortcoming in the matter of cultivation in the Sundarbans region : 'The present techniques of cultivation in the area are traditional and labour-intensive. Temporary labour shortage occurs during the transplanting of paddy (July- August) or again during harvesting season (December- January) in some areas. The cattle, in general, are poor and cannot sufficiently perform the job or tilling the soil during the monsoon season.' The National Commission on Agriculture stresses the importance of the development of fisheries (freshwater and brackish water) in the area to achieve an economic and ecological balance (IUCN, pp. 187-88).

Next to agriculture, fishing and fishery provide a lucrative, rather more lucrative source of income and employment to the people of the Sundarbans. The region has 'the biological (high natural productivity of estuarine waters), physical (tropical climate), and tidal amplitudes, favourable to fishing and prawn-culture.' It has, besides, an abundance of low-lying areas, with saline soil having no apparent agricultural value and also a socio-economic environment favourable to large-scale brackish-water agriculture. (Vide the Report of the Fact-Finding Committee set up by the West Bengal Government, 1984).

The fishery industry plays a significant role in the socio-economic life of the people of the Sundarbans. The industry is diverse in nature, comprising estuarine and coastal fisheries, brackish-water aqua-cultural techiques, the practice of alternating paddy cultivation with fish culture on the same piece of land, and paddy-cum-fish culture.The existing laws, however, do not consider fisheries as an agricultural activity, and agricultural lands may not be used for fish-farming. (IUCN, p. 188).

Fish which is an essential food-item of the Bengalees is available here in abundance and in various species in the rivers and creeks, e.g. Parse, Bhetki, Hilsa, Pomfret, Bhola, Bata, Topse, Shol, Shal, Bhangar, Rui, Katla, Mrigel, Kalbose, Chital, Pholui, Swarna Punti, Punti, Chang, Lata, Koi, Chela, Techoko, Mouli, Dowke, Common Carp, Silver Carp, Boal, Prawns and Shrimps (Dawke).

Statistics of some dominant species of fish and prawns in the estuarine area are shown in the following two Tables;

Table I

Dominant fish and prawns species in the estuarine area

Species	Fish Catch (in tonnes) — Nov.1985to Jan.1990			
	Nov.85– Oct. 86	Nov. 86– Oct . 87	Nov. 87– Oct . 88	Feb. 89– Jan. 90
Hilsa ilisha	2252·7	1935·3	1177·0	1563·4
Pama pama	3908·4	1090·8	3514·8	3978·2
Setipinna sp.	2055·8	1196·5	3852·5	4379·4
Trichiurus sp.	1473·3	1451·3	2502·3	3978·6
Harpodon nehereus	5197·7	2596·5	5084·1	4735·7
Tachysurus jella	702·2	366·6	758·0	432·8
Stromateus cinereus	344·4	357·8	682·2	160·1
Polynemus paradiseus	106·5	141·4	179·4	98·2
Coila sp.	479·1	536·7	1591·5	537·2
Hilsa alongata	315·7	288·3	838·8	413·4
Sciaena biaduritus	602·3	92·6	604·4	87·5
Polynemus indicus	31·0	147·2	174·9	191·3
Prawns	1892·4	2563·5	1787·0	2670·0
Others	7074·3	7039·4	8399·7	9906·8
Total	**26,435·6**	**19,797·9**	**31,146·6**	**33,139·6**

Table II

Yields of selected species in the Hooghly-Matla estuarine system

Species / species Group	Mean: 1983-86 (kg/ha)	Mean: 1987-88 (kg/ha)
Hilsa ilisha	2·23	1·31
Other clupieds	3·20	7·07
Cat fishes	0·69	1·13
Polynemids	0·28	0·42
Sciaenids	3·85	4·58
Mullets	0·03	0·02
Ribbon fish	3·21	2·78
Bombay duck	4·95	5·65
Prawn	2·69	1·99
Miscellaneous	8·90	9·66
Total	**30·3**	**34·61**

Food for Fishes

Fruits are an essential item of food for fish. During August–October, tonnes of fruits fall on water from trees when the fishes concentrate near the bank to feed on them. Kan magur and Pangas fishes are very much fond of the fruits of the Keora and Bain. One pangas fish weighing 12 kgs was found to have about 1 kg of Bain fruit in its stomach. [9] Fishes swim to the mangroves in search of food. 'Mangroves produce a large quantity of organic matters which sink deep into water. As the organic matters decompose, they are turned into detritus particles covered with bacteria, protozoa, and fungi. During the decomposition, plenty of carbon-dioxide is released. As a result, phytoplanktons multiply and zooplanktons in turn proliferate with the help of oxygen released by phytoplanktons. Shrimps, crabs, and parses feed on zooplanktons, while many aquatic and some terrestrial animals feed on them. Many varieties

of sea-fish spend a part of their life-time in the estuaries which are the ideal spawning ground for many varieties of fish. Experts believe that the excreta of crocodiles provides a considerable amount of nutrients to aquatic animals. The local fishermen catch about 120 varieties of fish in the region. It has also been established that coastal fishing depends on the mangroves to a large extent.' (10) Swage – fed water is a source of nourishing food to fish, also to paddy. The secret why prawn-spawns grow quickly within a period of 3 months up to a weight of about 1 kg is two-fold - rich sewage-fed water, and constant flushing by ebbs and tides which stimulate the growth of fish, particularly of prawn. (11) Again, 'pig dung,' experimented upon by experts, 'acts as an excellent pond fertilizer and raises the biological productivity of the pond water and consequently increases fish production. Further, the fish also feed directly on pig execreta which contains 70 pc digestable food for the fish. No supplementary fish feed or pond fertilizer is required in this system.' (12) Experts, therefore, encourage 'a production-system integrating pig husbandry with fish culture' by arranging pig-sites on the pond embankment or near the pond so that the wastes are directly drained into the pond or lifted from the animal house and applied to the pond. (13) As regards the hilsa fish, so much relished by Bengalee tongue, the quantity of its catch in the Sundarbans has been showing a declining trend. In 1962-63, the annual hilsa catch was 11,58,890 kg or 1158·89 tonnes from the Sundarbans but the annual catch from the estuaries during 1971-72 has been recorded as 150 tonnes, according to a survey. Siltation of river mouths near the sea and the formation of sand-bank, as also the non-observance of 'a closed season' in rivers and creeks during July-September to save brood are cited by experts as the reasons for such low output.(14)

No less palatable than the hilsa fish are the prawns the seeds of which float in abundance in the saline waters of rivers like the Bidyadhari. Everyday thousands of prawn-seed (thread-like fishlings released by mother-prawns) catchers, mostly womenfolk and children, can be seen dragging their mosquito-like nylon nets along the banks of the rivers like the Vidyadhari. Braving the danger from predatory animals, (15) these women and children cast their nets in the water during high tide, wait for some time, then take out the net, and differentiate the seedlings of prawn from other seedlings

of cheaper variety and carefully collect the prawn-seeds in a floated earthen container. The game is risky, unhealthy, but lucrative. The daily income from prawn-catching has been differently estimated by different experts. Generally it is estimated that the daily expenses of a family are liberally met from their income from prawn-seed catching. The seedlings are purchased at a very cheap rate by the owners of Bheris at Nazot, Basanti, Kakdwip, and Dhamakhali. They develop them in impounded fisheries into healthy prawns within a period of 3 to 6 months and sell them in the market for export at a fabulous price. Out of the total fish production of 1,789 Metric tons within the area of 2,566 hectares in 1991-92 in Basanti, Canning, Kultali, Kulpi, Namkhana, Sagar, Patharpratima, Mathurapur, and Gosaba, all in South 24-Parganas, Bagda fish represented 30 Per cent while Bhetki, Parse, etc, 70 Per cent. sold at the market at an incredible difference in selling price. While, for instance, the cost of Bhetki etc. was only Rs. 30,000/- per ton, Bagda Chingri was sold at Rs. 1·50 lakhs per ton, according to the Fishery Department Statistics of 1991-92. The statistics were made available by the courtesy of Mr. A. K. Sen, Jt. Director, West Bengal Government Fishery Dept. (now Retd.). The proverbial hankering of the Bengalees for a delicacy like Bagda prawn is not met by the fishery-owner. Only ' the heads of prawns' which are left behind percolate in local markets .

The process of catching tiger-prawn seeds destroys at least 72 varieties of the Sundarbans fresh-water fishes. As the Fact-finding Committee comments : 'We have evidence that at the time of catching seedlings there is a tendency for throwing out seedlings other than prawn as they fetch little money-value. The result is the destruction of a large quantity of fish of other varieties which could otherwise satisfy the fish-hunger of the Bengalees in Calcutta and the neighbouring areas.'

The Fact finding Report mentions the strength of fisheries in the Sundarbans in different years. In 1958, for instance, there were 92 fisheries in the Sundarbans area, the biggest being the Bokaria fishery with an area of 2,469·31 acres under Haroa Police Station. Those fisheries were classified as follows :

		No
a)	Fisheries in the marshy areas	14
b)	Fisheries partly in marshy areas and partly in inundated agricultural lands	9
c)	Fisheries partly in non-agricultural land and partly in inundated agriculture land	26
d)	Fisheries exclusively in agricultural land, subsequently inundated	31
e)	Fisheries exclusively in non-agricultural land subsequently inundated	6
f)	Fisheries created by constructing embankments in the low-lying areas accreted from the rivers	6
		92

Time-series data for the construction of the 92 fisheries are as follows :

1915	—	1	1943	—	1
1925	—	1	1945	—	4
1926	—	8	1946	—	9
1932	—	1	1947	—	4
1934	—	3	1948	—	6
1935	—	5	1949	—	10
1938	—	1	1950	—	6
1939	—	4	1951	—	14
1940	—	1	1952	—	5
1942	—	3	1953	—	4
			1954	—	1
			Grand Total -		**92**

The Fact-Finding Report (Appendix X) records the following 621 fisheries in 1983, owned by Licensed Producers under W.B. Fish Dealers' Licensing Order,1975.

Names of Police Station		No. of fisheries
Rajarhat	—	7
Gosaba	—	7
Sandeshkhali	—	116
Deganga	—	21
Haroa	—	169
Minakhan	—	48
Gaighata	—	1
Basirhat	—	54
Barasat	—	48
Hingulganj	—	4
Hasnabad	—	43
Patharpratima	—	7
Canning	—	33
Kultali	—	31
Mathurapur	—	21
Basanti	—	11
		621

The Fact-finding Committee (pages 54-55) records below to what extent paddy-cultivation in the traditional way has been affected by the paddy-cum-brackish water fishery system :

'We do not have any overall figure of production of paddy in the Sundarbans area but from the fact that about 60,000 acres of good paddy-lands have been converted into fisheries the inevitable conclusion is that there has been a tremendous loss in the production of paddy in the area. Cultivation of paddy has been a traditional mode of avocation since long time in the past, around which peaceful traditional village-life throbbed. Earlier, the cultivation of paddy generated a flow of employment opportunities to different levels of persons including village craftsmen. The will to work and the dignity of labour were a part of the culture of cultivation. The newly transformed village-life of the Sundarbans areas caused by the infiltration of fisheries is completely divorced from the traditional way of life of the villagers and has generated an anti-culture outlook, breeding urban law and order problem in a village society.'

Two kinds of fisheries have been distinguished by the Fact-finding Committee (a) Permanent or old or Recorded fisheries. that is, those recorded as such in the Settlement records. and (b) paddy-cum-brackish water fisheries which are not considered as fisheries in the Settlement records but are recorded as paddy–lands of different classifications. Paddy-cum-brackish water fisheries are actually agricultural lands, converted into fisheries temporarily in recent years. The former consist mainly of sweet–water fisheries and the latter, mainly of brackish-water ones. The Fishery Department issued licences for the conversion of paddy-fields into temporary paddy-cum-fisheries. There are also a large number of cases where unauthorized conversion of paddy-lands into fisheries has been resorted to. The incidence of such unauthorized conversion occurs mainly in Minakhan, Haroa, Hasnabad, Sandeshkhali, Hingulganj, Basanti, Gosaba, Mathurapur, and Canning Police Stations areas.(Fact Finding Report, p. 125).

In the Basirhat sub-division, more than 75 per cent of unauthorized conversions have taken place. In all those areas, the flood-arresting embankments, with drainage sluice–gates constructed by the Irrigation Department, are often breached by the local people in their attempt to convert paddy-fields into fisheries. (Ibid).

Paddy-cum-brackish-water fisheries or jalkars, as locally known, are a unique land-use development in the Sundarbans through the introduction of Brackish-water fish and prawn culture as a second crop in the mono-cropped Aman lands after their harvesting is over. Vast sheets of water of 100 to 300 acres in area or more and about 3 feet in depth, bounded by earthen bunds, are the so-called paddy-cum- brackish water fisheries which have been recently proliferated in the South Sundarbans area. Such fisheries are brought into existence when the raiyats lease out their paddy-fields for fish-culture to the Bhery–or Ghery–owners by executing with them unauthorized agreements that they would surrender their rights in their lands for a specified period, 5 years, for instance, in exchange for a consideration which varies form place to place. Generally, as reported by the Fact Finding Committee, the rate varies from Rs.100 to 1040 per bigha, with provision for extra sums for compensation for special reasons. The lease-rent is found to be the highest in the Hasnabad Police Station and the lowest in the Police Station of Patharpratima. A plot of paddy-field is leased out to the highest

bidder by December each season, initially for about a year, on condition that by the following July-August the sprouting seeds of mono-cropped Aman paddy would be transplanted by the owner of the paddy-field in the fishery area, on his executing with the lessee (fishery-owner) an unregistered bond called 'Amlanama.' Following the grant of the lease, the plot of land is converted into a fishery by the lessee by entering brackish and sewage-fed water into the field and releasing fishlings there with necessary protective measures. Then, true to the Amlanama, the fishery-owner would allow the owner of the field to transplant Aman-plants by July- August, temporarily transferring the fishes to some peripheral canal during the process of transplantation. Within about 15 days the Aman Plants are transplanted to the fishery area by the owner of the paddy-field. Meanwhile, by July-August, the bagda-prawns have grown-up, and such grown-up bagda chingries are then sold in the fish-market at a fabulous price while the remaining fishes (Bhetki, Parse, etc.) are once more moved back from the peripheral canal to the fishery after the transplantation of the Aman plants is over. Thus paddy plants and fish grow simultaneously at the same fishery area.

This paddy-cum-fishery system is favourable to the growth of both paddy and fish on the same piece of land. As stated in the Census of 1951, District Handbook of 24-Parganas, page Lxxvii, as the fish move about in the paddy-cum-fishery area, the paddy plants are shaken and the insect-pests of the paddy plants that drop to the water-surface provide an excellent food for fish. The movement and ground-feeding habits of some of the carps help to increase the tillering action, causing the loosening of the soil and weeds. The paddy crop also benefits from the excrement of the fish which serves as a manure. In China, Japan, and other Far Eastern countries, yields of paddy have been observed to increase by about 5-15 per cent and the growth of fish by about 30 per cent in the paddy-cum-fishery culture.

Fishery has been 'a low-cost-high-productive and sensitive resource system over the centuries! In the semi-intensive mono-culture of Bagda prawn (1 MT) in one hectare water-area, the net returns are between Rs. 40,000 and Rs. 50,000, whereas the net returns from paddy cultivation (mono-cropped Aman), 2·2 MT, on the same area of land vary between Rs. 3000 and Rs. 3500, according to the statistics of prices, as in 1991-92. Obviously, the returns

from fishery are higher than the same from paddy cultivation. Again, as regards income from paddy-cum-fishery per hectare, the net returns from fish-culture (fish and prawn) vary between Rs. 15,000 and Rs. 20,000 while the net returns from paddy cultivation vary between Rs. 3,000 and 3,500 only, fish and paddy together roughly totalling up to about Rs. 23,000 as per 1991-92 statistics of prices. Individually, it is evident, the returns from fishery are much higher than the same from paddy-cultivation. The total employment from paddy-cum-brackish water fishery, it may be mentioned here, is for about 500 man-days per hectare per annum, of which about 50 per cent is offered by fish cultivation and the rest 50 per cent by paddy cultivation. It is seen that on average 5 to 6 maunds of paddy used to be cultivated on lands previous to their conversion into fisheries. The possibility for under-statement cannot be ruled out because the local people seem to have found a justification for opting in favour of fishery. Even if the yield is slightly higher, income from paddy appeared to the people to be less in comparison to income from fishery. That fishery offers greater attraction to the land-owners than paddy-cultivation would be evident from the fact that fishery ensures a steady income, absence of the risk of crop-failure, freedom from the botheration of harvesting and land-disputes, possibility of getting some extra paddy from the same fishery during the period the water is drained out from the fishery, as also the chance for earning some wages by working in the fishery.

The Fact-Finding Committee members interviewed many raiyats to ascertain their individual views on the paddy-cum-fishery system. Many argued that in addition to money from fishery they got a few bags of paddy in good years. Moreover, fishery was free from the troubles entailed by cultivation. There was, for instance, no need for ploughing the lands and there was no cost of cultivation. Some raiyats held that the 'jalkar system' benefited their families and their earnings increased to a considerable extent. According to the evidence of some raiyats, they handed over their land for about 9 or 10 months for the purpose of fishery, took back their own land for the remaining 2 or 3 months when they grew paddy and arranged for next year's auction for giving publicity to their scheme of leasing out their land for fishery. The raiyats argued that brackish- water did not diminish the productivity of land because of the silt carried

down by rivers to the lands and the supply of soil-fertilizing sewage through the Calcutta Corporation Sewage system from the Kulti Lock Gate of the Bidyadhari. One raiyat at Dhobia, Md. Hayat Ali, in reply to a question 'whether he would revert to paddy cultivation if all arrangements for double crop were made,' said that he would be more benefited by the present system of paddy-cum-fishery. Another raiyat, Abdul Rahim Baidya, the owner 7 or 8 bighas of land which he handed over for fishery, said in the course of an interview that previously he could not get any paddy every year from his lands but now thanks to jalkar he got paddy every year in addition to jalkar money. Another piece of interesting information supplied by him was that this year (1984) the highest offer by a gheri-owner to the land-owners was Rs.1040 per bigha. A person owning 20 bighas of land would be getting 'Rs. 20,000 or more without any labour or worry. Apparently earning a huge sum of money from the fishery without any sort of physical labour generated a tendency amongst young land–owners for leading an easy and luxurious life. Writes the Convener of the Fact-Finding Committee in this connection: 'Though the apparels of a costly variety in respect of a villager are not a definite indicator (of affluence), I found a large number of young land-owners wore such apparels, with wrist watches, having the appearance of a Babu rather than (that of) a cultivator.'

Among the other persons interviewed, mention may be made of Aswini Sau of South Gopalnagar under Patharpratima Police Station. According to his evidence, out of his 9 bighas of land, he cultivated 'Pona' fish in 2 bighas, and in the rest, both paddy and 'pona' fish. He got about 18 maunds of paddy per bigha both in the Kharif season and the Rabi season. He also got Rs. 1,000 out of fish cultivation in the 2 bighas of land. According to him, both paddy and sweet-water fish could be cultivated simultaneously but if one grew high-yielding variety of paddy, the culture of sweet-water fish would not be possible as insecticides would kill such sweet-water fish. According to the evidence of Kanai Lal Das from the same area, he grew both paddy and fish in the 15 bighas of land he possessed and reaped 7 maunds of paddy per Bigha in the Kharif season and 22 manuds in the Rabi season, besides earning Rs. 1,000 per bigha from fish cultivation.

Evidently, to the cultivators fish-culture on agricultural land is

more profit-earning than agriculture. Lured by the prospects of an immediate profit from fishery, the land-owners, however, it is held, fail to calculate the long-time damage done to agriculture in the process. According to expert opinion, they fail to bring themselves to the realization of the evils of paddy-cum-fishery system. To give some instances from the Fact-finding Report, (a) saline water, kept confined in basin-like areas which are abundant in the Sundarbans permanently damages the soil for the purpose of paddy-cultivation. When, however, saline water enters a flat land which can be flushed out, the land can be reclaimed and made fit for paddy cultivation after waiting for some time. (b) Adjacent lands are damaged by the sewerage of saline water. Moreover, banana trees, coconut trees, vegetables, and other plants are damaged by the proximity of saline water. (c) Since brackish water has to be flushed in and out of the paddy-cum-fisheries, fishery-owners cut the irrigation bunds indiscriminately without obtaining any prior permission from the Irrigation Department for the same. While some fishery-operators construct improvised sluices called 'Bakshakalls', the majority of them breach the Irrigation bunds indiscriminately, without taking any safety precautions into consideration. Such thoughtless cutting of the already existing irrigation bunds causes loss of life and damage to property in the interior areas by floods, cyclones, and storms. (d) Once a raiyat decides to lease out his lands for fishery, he is forced to continue employing his lands under fishery because such lands cannot be reclaimed and rendered fit for the plough, without keeping them fallow for about 2 years during which period he may have to starve. Or,again, if the lands of the raiyat fall in a pocket surrounded by the lands of other raiyats willing to lease out their lands for paddy-cum-fishery or if the lands are adjacent to some fishery, the raiyat in question is forced to lease out his lands for fishery purpose, because, otherwise, his lands would not be saved from the inroads of brackish water, so unfavourable to paddy cultivation. (e) Catchers of prawn-seedlings in the course of their operation simply throw away the seedlings of other varieties of fishes and thus destroy them on the ground that market for the latter is comparatively poor. The non-prawn seedlings, if saved, could have fed the local markets to a considerable extent. But that was not to be. One estimate, according to the Fact-finding Report, shows that, out of a total catch, 30 per cent, as stated earlier, are prawn-seeds

and the rest, that is 70 per cent, are thus destroyed. (f) The bright prospects of quick money from fisheries have prompted many land-owners to surrender fertile paddy-fields for the purpose of fishery while keeping some marginal lands for cultivation. The paddy grown in the dry months of the fishery is not grown with care because, according to the terms of the agreement, the land-holder or raiyat is prevented from using any fertilizer or insecticides, harmful to fishery. (g) Moreover, fishery-owners have to depend on mafias for protecting their fishery. As reported by the Fact-finding Committee, the incidences of dacoity, murder, theft and rioting are on the increase in the Sundarbans, and one reason for this is the existence of such fisheries. This poses not only law-and-order problem but also degrades social culture and rural standard of the villagers. (h) Above all, as stated in the Report of the Fact-finding Committee, paddy-cum-fishery favours 'top-sided economy'. The high profits from fisheries are concentrated in the hands of a few bheri-owners, middlemen, and exporters, while the hapless village-folk who catch seedlings at a great risk to their lives as also the marginal raiyats and the needy sections of the rural society are denied any financial justice from the profits of the fishery. 'The high profits generate black-money and the attendant evils in the rural society.'

The loss to agriculture is imaginable from the conversion of some 60,000 acres of fertile paddy-fields into fisheries, as noted earlier. While some project the damage caused to agriculture and agrucultural land by fishery, as stated above, there are others who are in favour of developing the fishery industry at any cost. The latter regret that the national land-use policy (for example, in the South 24-Parganas) favours the utilization of land for agriculture and human settlement only. The existing laws do not consider fisheries as an agricultural pursuit, and agricultural land is not considered as usuable for fish-farming. The coastal belt of the estuarine area of the Sundarbans is regarded as prejudicial to agricultural activity because of the saline water, harmful to agriculture. Hence, the estuarine area has been earmarked as 'a waste or degraded area' for the purpose of agricultural pursuits and human settlement. To serve the twin purpose a considerable portion of the jungle area has been reclaimed over the past 200 years. For the protection of the reclaimed area from the contact of the estuarine saline water embankments have been built, which have, however, created new

problems in the process. The rivers of the Sundarbans are tidal but free tidal flushing of the spill areas is interrupted by the premature reclamation and human interference in the form of the construction of embankments, with the result that the river-beds are elevated and the drainage problem of the islands is aggravated. Moreover, it is held that the reclaimed areas lack in basic facilities for living and that the inhabitants live at a subsistence level. Circumstances such as these favour a change in the existing national land-use policy for the sake of improving the living conditions of the Sundarbans people through the stepping up of the fishery industry by treating it as an agricultural activity and holding agricultural land as usable for fish-farming. Above all, fishery is more income-earning than agricultural pursuits, as explained earlier.

The Sundarbans estuarine area is unique as it sustains the wetland mangrove eco-system which suffers from human interference by way of the reclamation policy of Government, which has unfortunately caused serious environmental dislocation. Such human interference has originated from 'misclassifying' the saline estuarine land as 'waste or degraded soil' as noticed earlier, through a wrong concept. The salinity of the estuarine water may be unfavourable to agriculture but it is 'wealth' in the sense that it sustains the growth of the mangrove forest and fishes depend upon them for their sustenance.fromthis angle, it is desirable that a balanced land-use classiffication and land-use policy for the Sundarbans need be made, which is very essential at the hour to the sustainable socio-ecological and economic development of this backward region. There is a long-standing conflict in the Sunadrbans over the uses of land for agricultural crops and brackish-water fishery. The earlier the conflict be settled the better for the Sundarbans people.

Economic importance of forests

The original forest area below the Dampier-Hodges line was 9,630 sq km. Reclamation reduced the area to 4,264 sq km. of mangroves and mangrove associates, some species of which have been mentioned in chapter I, such as Sundri, Keora, Goran, Genwa, Keya, Golpata etc. The trees supply wood and timber, harnessed to diverse uses, also honey and wax. Early man obtained almost everything of daily necessity—food, housing material, clothing, fire, tools, weapons, etc.— from forest produce. The dependence of modern

man on forest products has been on the increase. To the Sundarbans people the mangrove forest is an invaluable source of their livelihood. Every year 5,000 wood-cutters enter the deep forest area, ignoring the fear of death, under compulsion for livelihood. A select list of trees which are of great utility to the people of the Sundarbans and the neighbouring areas is given below by way of illustration.

Sundri : Sundri tree yields a useful hard wood and is used for posts, beams, buggy shafts, paddles, flooring planks, and native furniture. Sundri is, however, used chiefly for boat-building. By far the greater number of boats used in the Sundarbans and in the northern districts of the 24-Parganas, Jessore, and Backarganj are made either entirely or in part of the Sundri wood as being the most durable wood in Saltwater. Enormous quantities of this timber, generally cut into blocks of from 10 to 12 feet in length, are brought to market for sale.

Golpata : Its leaves are used for thatching purpose.

Gengwa : It is in demand for matches and match-boxes.

Keora : A soft wood, chiefly used for planks, trunks, packing cases, and plank bedsteads. Keora along with Genwa has a great market in Calcutta. It is curious that Keoratala Ghat, one of the largest cremation grounds in Calcutta, derives its name from Keora. Some Keora trees were unearthed at the area in the 19th century.

Goran : It is used as posts for native huts. It grows extensively throughout the former united Sundarbans but principally in the present 24-Parganas Sundarbans. Goran bark is used for tanning while Goran stick has demand for fuel, walling, fencing posts etc. Goran is an important source of revenue.

Dhundul : Its timber is used for the manufacture of pen-holders, used in certain firms. It is also used as durable house-posts.

Hental : The trunk of the young Hental is made into walking sticks while larger Hental trees are utilized as roof-rafters and beams. The leaves are used for thatching native huts.

Kankra : It is a hard and durable wood, used as posts for native huts, as planks, and articles of native furniture. The tree is found throughout the Sundarbans area and its wood is exported in logs.

Khalsi : It is a soft wood used principally as fuel.

Singra : It is chiefly used as fuel, the most popular fuel in the Sundarbans.

Kripe : It is a hard wood principally used as fuel.

There are, besides, other trees that are useful to the daily life of the Sundarbans people in different ways— Harguza, Lata Harguza, Tora, Piara Baen, Kala Baen, Jat Baen, Hodo, Bakul, Dakor, Banjai, Nate, Kalilata, Gila, Bhola, Garia, Keya, Garjan, Ulu, Gira Sak, Nona Guru, Paras, Nana Jhau, Math Goran Jadu, Jadu Palang.

The classes of people who principally employ themselves as wood-cutters are of the lower orders belonging to the Muslim community and different castes (loosely speaking) of the Hindus–Pod, Bagdi, Kaora, Tior, Chandal, Kaibarta and Kapali. These 'castes' earn their living mainly as cultivators and fishermen and employ their spare time in felling timber. If in any year they employ themselves exclusively in wood-cutting, they engage others in the cultivation of land and pay them in kind, that is, by a share of the produce.

We may form some idea about the habits of the regular wood-cutters in the 24-Parganas portion of the Sundarbans in the light of the habits of their counterparts in Jessore, as depicted by Westland in his Report on Jessore :

When the rains have ceased, their (wood-cutters) season begins. A body of them start in a native ship for the Sundarbans far south and near the sea. Their craft is provisioned for 4 months or so and during that period it remains anchored at the place which they choose as their headquarters. A party usually consists of 10 or 15 men. During the 4 months they are absent they cut the trees, hew the wood and bind it into rafts. When the rafts are ready, some of the party float them down the flood-tide to the place of delivery while the rest go on with the wood-cutting.

So great is the demand for wood, specially for firewood, that it offers ample inducement to cultivators to engage in wood-cutting trade even when they are comparatively well off.

Among the trees listed above there are some the timber of which commands a large market for sale. The marketability of such timber is presented below : [16]

Sundri in the form of timber and poles was at one time the most important marketable product from the eastern Sundarbans forest. The Sundri merchants from the Barsakati markets of Barisal were known to have monopoly control over auction sales. A certain amount of Sundri fuel is consumed in Calcutta and Jessore. There

was also a limited sale in Calcutta and Jessore of small poles, used mostly for making the hubs and axles of cart wheels. The commercial value of Sundri is felt very little at present outside Barisal. The competition of Teak, Sal, and Jarul has led to the contraction of the Sundri market.

Gengwa is the next important marketable timber. The Gengwa timber products (box-planking, matches, and match-boxes) are much in demand in Calcutta market. Logs and poles for matches etc. are exported from the Sundarbans. Keora offers a large-sized timber having a good market. Formerly it was sold extensively in Calcutta market for box planking. Baen presents another large-sized timber promising an extensive market for planking. Hollow Baen boles are used by the local people for constructing sluices through their bunds. The durable house-posts made of Dhundal have an extensive use in rural locations. In Calcutta, the Dhundal timber is used by one factory for making pencils and pen-handles. Goran has an extensive sale in Calcutta for firewood. Throughout the 24-Parganas, Khulna, Barisal, and Jessore, Goran products have a good market for sale. The leaves of Golpata are used extensively for thatching practically in all places to which transport from the Sundarbans is reasonably cheap. Ulu grass makes the most durable type of local thatching. Nal grass is used extensively for making a matting, locally called Darma, which is used for the walls of houses, the covering of boats, and mats. Hogla used in cheap fencing walls has also a demand, though small.

There is a great demand for honey and wax permits during the proper season. Honey is used both for ordinary consumption and as an ingredient in Kaviraji medicine. Wax is exported mostly to Calcutta where it is used for pharmaceutical works, cartridge, and shot-factories, and for making candles. Revenues from both honey and wax have already been mentioned in chapter III above.

'Jhongra' shells are collected off the mud banks of rivers and khals for burning into lime for use with 'pan' (betels). The shells of 'Jhinook' are also quite common and often collected for lime. Oyster beds are found here and there in the small khals of salt-water localities but their shells are not utilized to any extent.

It thus appears that the Sundarbans forest products find their way to most parts of the surrounding districts which are within reasonable distance by water-passage—Calcutta, North 24-Parganas.

Khulna, Jessore, Barisal, and Faridpur. During the winter season there is also a limited export across the Bay of Bengal to the Chittagong and Noakhali districts.

The following is a list of the principal distributing and sale centres of the Sundarban forest products : [17]

Chittagang and Noakhali districts — Goran and Golpata;

Faridpur district — Sundri, Passur and Dhundul;

Barisal District — Sundri, Baen, Keora timber, Goran poles, Amur poles, Singra and Goran fuel, Golpata leaves;

Jessore district — Wood-cutters generally sell Sundri poles for cart axles direct to the consumers in the various villages but there are one or two markets such as Bardia (off the Bhairab via the Kaliganga Khal) where Sundri poles, Dhundul outposts, and Goran outposts are sold.

Khulna district — Baen logs, Goran poles, Singra and other fuels, Golpata leaves, etc.

24-Parganas — Basirhat Sub-division–Goran poles, Baen, Singra, and Goran fuel, and Golpata leaves. Hingulganj is an important market for honey, wax, Dhundul posts, Kirpa Poles, Hental.

Calcutta and environs — Goran fuel, poles and bark, Gengwa logs, poles, plank; Golpata leaves, Sundri poles for cart axles; Baen fuel.

Baen fuel, sold in the markets of Howrah and Midnapur districts and in the northern part of Diamond Harbour, is used mostly for baking roof-tiles and pottery. This fuel is imported from the western Sundarbans and is generally white Baen.

Trade activities

Forest and agriculture are the two main economic sources of exports from the Sundarbans. The chief exports from the Sundarbans are timber, firewood, canes, reeds, thatching-leaves, honey, wax, shell-lime, rice, gur or raw-sugar. The rice crop of the Sundarbans is more than sufficient for local consumption, the surplus being exported to Calcutta and the neighbouring districts.

Considering that the rural area has few wants, the chief imports into the Sundarbans consist of oil, salt, tobacco, pottery, hookah, pipes, pulses, clothing and a few iron agricultural implements. But old order has changed, yielding place to the new. In the years following the partition, specially the Sundarbans people with their communication facilities with Calcutta improved have come to develop an urban taste of life, and the younger generation among the upper middle-class families are inclined towards using fashionable articles in place of the traditional ones.Their wants have increased.

Trade is carried on in village markets like Chandkhali and Morrellganj at fairs and places of religious gatherings. If formerly the solvent economic condition of an ordinary middle-class family including peasant's family was measured in terms of the amount of land possessed and the quantity of paddy stored, it is currently indicated mainly by the amount of cash-money at hand. The rural folk of the Sundarbans having an easy railway communication with Calcutta are now privileged to deposit money in Banks, which facility was denied to their forefathers.

Rice-trade is a significant aspect of the Sundarbans economy. The cultivators dispose of their surplus rice by selling it in the Hut or market. Westland refers to a line of huts in the north of the Sundarbans to which grains were brought for sale, namely Chandkhali, Paikgachha, Surkhali, Gauramba, Rampal (or Parikhali), and Morrellganj. According to Westland's description (19th century), from long distances the grains were brought up by the raiyats in their boats to these huts. Of these huts, the chief was then Chandkhali, and Monday was the hut day. Brisk trade went on during the hut-day when raiyats came to sell their grains and to buy their stores– oil, turmeric, tobacco, vegetables, and all other luxuries of a raiyat's life. By Tuesday the place was deserted for another week. At Chandkhali Hut alone, 3,000 or 4,000 rupees worth of rice on an average changed hands every hut day, and during the busiest season the amount probably reached twice that quantity and about 1500 boats were brought up by people attending the hut-boats, being the only means of travelling here. Nearly the whole of rice-trade of the Sundarbans is drawn by Calcutta. The significance of Hut or market for the sale of rice has not diminished in the terrain's economic life.

Report of the Sundarban Development Committee, 1950, mentions 16 rice mills of which '14 are reported to be working

satisfactorily.' The biggest rice mill is situated in Hingulganj. It has been experiencing great difficulty, according to the Committee Report, in maintaining production at full capacity since the partition, as its main supply of paddy was from Satkhira, now in Bangladesh. There is also a shortage of local labour for the mills, and the new mills such as at Basanti have been importing labour from South India.

Rice-milling and salt-manufacture are the two organized industries attempted in the Sundarbans so far, reports the Sundarban Development Committee, 1950. The Sundarbans have a small salt-manufacturing industry in the areas under the Police Stations of Canning, Mathurapur, and Jaynagar. Two salt ware-houses are located in Kakdwip and the Sagar Island. Salt manufacture on a cottage industry basis is on the decline.

Salt-manufacture is traced back to the Mughal age. According to Hunter's Statistical Account of Bengal, vol.1 (page 389), the duties paid to the State by the salt workers in the Sundarbans amounted, in 1582, to Rs. 25,382 out of which Sarkar Fathiabad (both sides of the Meghna) paid Rs. 6,444 and the rest was charged to Sarkar Chittagong. In 1781, when the Company resumed its right to the entire profit accruing from the salt manufacture, the Malanghis commanded a strength of 60,000, the manufacture of salt was estimated at 28 lakhs of maunds and the gross sale amounted to Rs. 54,50,000, with a clear profit of Rs. 35,00,000.

References may also be made to such small industries as those of shell-lime, lime-ash, reed, and mat-making. Shells collected from the river banks and marshes are burnt to form lime. The trade in lime seems to be an ancient one. According to Westland, the old building of Khanj Ali appeared to have been built with lime, and large quantities of lime were sent down to Calcutta for use in building or repairing Government Houses. It is in 'Chunam' or plaster that the chief use of lime lay. The ashes of shell-lime mixed with water form lime-ash or 'chhai' 'which natives chew with pan leaf', writes Westland. (Ibid, p. 190).

Another Sundarban industry is concerned with reeds which are extensively used for making mats and baskets. The mat-makers, Naluas by caste, do not ordinarily dwell within the Sundarbans area, their chief dwelling places being Phultalla, Satrajitpur, Binadpur, and Magurah. During cold weather they collect large quantities of

reed from the Sundarbans, dry them and then weave into mats. Reeds are used also for making baskets which are called 'Dhama'.

In fact, except for a few rice mills organized industry is practically non-existent in the Sundarbans,' (IUCN, 148). There are some handloom, pottery, and handicraft industries in the region. Wood crafts, soap manufacturing, spice-grinding and lime manufacturing, as stated above, have been initiated (Ibid.). A large dry-fish industry has been developed on Jambu Island where 'Harpodon nehereus' is dried along with Trichiurus Savala, T. Gangeticus and other varieties of fish. Annually 2,000 metric tons of fish are collected and dried by about 12,000 fishermen (IUCN, 148).

Economic life of people

The peculiar ecological condition of the Sundarbans has made it a unique region, unique in the sense that the inhabitants are poor, though the country is potentially rich in economic resources. The rural people are mostly landless and maintain themselves by collecting and selling forest produce such as timber, honey, and wax, by fishing prawns and selling them to the Bheri-owners, and by working as day-labourers. Indeed, the people are efficient agriculturists, expert fish-catchers, hardy and brave wood-cutters, and daring honey-collectors. Struggle against Nature has made them hardy, brave, and industrious. It is paradoxical, indeed, that despite Nature's bountifulness, inhabitants' hardy nature and their industriousness, they are not guaranteed a debt-free life or a life above the plimsoll line of poverty. Critics argue that their poverty has stemmed mainly from the fact that 'no concerted attempt has been made so far to utilize the biotic and abiotic resources of the region to the optimum level for the welfare of the region and people. The region is not industrially advanced. This deprives the people of the benefits of industrial occupations for the betterment of their economic lot. As regards crafts, the Sundarbans people do not have many of them. Their crafts mostly comprise dolls and idols, coloured pictures, and designs, needle-work on blankets, cane and bamboo work. And yet the Sundarbans are rich in human resources, which keep the region going, such human resources comprising, as refered to above, extremely hard-working farmers and agricultural labourers, who have to struggle hard for existence amidst most adverse circumstances, who have excellent expertise in fishing, wood-cutting, and honey-gathering.

It follows that the main occupation of the rural people is agriculture and that they also employ themselves in fishing, professions of boatmen or wood-cutting or honey-collection as a subsidiary means of livelihood in addition to cultivation. The strength of those who generally engage themselves each year as fishermen, honey-collectors, and wood-cutters is estimated respectively at 5,000, 500, and 500, as also noticed earlier.

Condition of cultivators, domestic animals, etc.

Most of the cultivators being landless labourers, hardly know what solvency in day-to-day life means. The picture was no different as in the days of Hunter (latter part of the 19th century). Hunter writes in his Statistical Account of Bengal, 1875, vol.1, (page 336 ff) : 'A small holding of 5 acres would not make a peasant as well-off as a respectable retail shop-keeper nor would it enable him to live as well as a man earning 16s a month in wages. In the more fertile and elevated Sundarban lands in the west of 24-Parganas and in Backarganj, the peasantry as a rule are prosperous and free from debt. In the intermediate tracts–namely eastern part of the 24-Parganas and Jessore Sundarbans – the smaller cultivators are generally more or less in debt. Most of the cultivators in the Sundarbans hold their land with occupancy rights. Very few of the husbandmen hold their lands on a permanent tenure or without being liable to enhancement of rent. No class of small proprietors is found in the Sundarbans who own, occupy, and cultivate hereditary lands, without either a zamindar or superior-holder above them or a sub-holder or krishan or day-labourer under them.' The picture is more or less the same these days also.

As in the past, lands are cultivated with bullocks. Cows are maintained for milk both for home-consumption and sale outside to supplement domestic income. The Sundarbans Development Committee reported in 1950 on a large duck population in the Sundarbans area, on an export trade in eggs and on a regular export of goats, of hides and skins, from Kakdwip and a few other places. On the quality of the Sundarbans cattle, as by 1950, the Sundarbans Development Committee reported: 'The quality of cattle is poorer than elsewhere in the province and this is attributed to the salinity of the area, lack of suitable fodder, and non–availability of grazing fields. Paddy straw is practically the only fodder used. There is a general

deficiency of draught cattle which have to be imported from Midnapur and other areas. Buffaloes are widely believed to be more suitable for draught purpose than bullocks in the Sundarbans climate.

Agricultural implements, as used in the by-gone days, are used these days also– plough, sickle, bamboo–ladder used for breaking up ground after ploughing, a sort of light crowbar with a wooden handle and iron head for digging holes, etc.

Economic development of Gosaba, Rangabelia, and Satjelia with the initiative of Sir Daniel Hamilton.

Sir Daniel Hamilton of Scotland came down to Bengal in connection with his service and subsequently settled down by the side of the river Vidya in the Sundarbans area and organized a cooperative life, embracing the three Islands of Gosaba, Rangabelia, and Satjelia, an outstanding achievement of a foreigner who left an indelible impression of self-sacrifice and magnanimity on the mind of the people of the Sundarbans in particular, and of Bengal, in general.

Sir Daniel obtained a lease of four Sundarbans Lots under the Gosaba Estate, namely Gosaba Island, Lot No. 149, Lot No. 143, and Lot No. 148. He took the lease of the first three Lots in 1903 for 40 years and of the last one for the same period in 1909. His lease-area was inclusive of Rangabelia and Satjelia. When he first took the lease, the lease-area was covered with deep jungle and was infested with wild and ferocious animals like tigers and crocodiles. With money from his own purse and with labour imported from a long distance, he reclaimed the area for human habitation and cultivation and gave the settlers the blessings of a settled life under a cooperative commonwealth. People learnt to live under a cooperative society which freed them from the hands of usurious mahajans or money-lenders and taught them to live with a mind free from fear and with head held high.

To counteract the evils of borrowing money from the extortionate mahajans Sir Danial thought of starting cooperative societies. Thus the first cooperative Bank, the Gosaba Bank, was started in 1915, followed by more cooperative societies. A cooperative Bhandar (Store) was started mainly for the supply of all kinds of necessary articles at the cheapest rates. An Allopathic Charitable

Dispensary was started in Gosaba in 1910. During this period one Homoeopathic Charitable Dispensary was founded at Rangabelia, Lot 143. Both Sir Daniel and Lady Hamilton took much interest in education and set up many village-schools for the education of both boys and girls. Miss E. O. White was appointed to look after educational matters. Sir Daniel was not indifferent to the building up of moral character of the people either. In his attempt to improve their moral condition, he removed the bad elements, not amenable to reform, from his Estate. During the reclamation of his Estate, Sir Daniel experienced a lot of trouble for want of drinkable water for his labourers. He had to arrange for a powerful distilling apparatus for supplying drinkable water to them. Remembering those difficult days, he sank a large number of drinking-water tanks in different parts of his Estate. An agricultural farm was started, with a Government office of the Agricultural Department appointed to boost agricultural pursuits. A Rain Gauze was fixed in the farm to record rainfall here. Sir Daniel taught the people to settle their disputes through Panchayats without resorting to law-courts. In fact, there was not a single civil or criminal court in Gosaba since the beginning of the Estate. During the survey and settlement operations between 1921 and 1928, there was not a single dispute before the settlement officers from Gosaba Estate— a dispute between a tenant and landlord or between a tenant and a tenant. All such disputes were amicably settled with the help of Panchayats.

The joint efforts of Sir Daniel and Lady Hamilton led to an appreciable all-round development of the Estate: During 1921-28 the reclaimed area amounted to 37,000 bighas. The number of Cooperative Rural Societies rose from 10 to 18. A Co-operative Paddy-Sale Society was started in 1923. A Cooperative Branch Store at Rangabalia was opened in 1928, a Gosaba Central Bank in 1922. The above-mentioned Co-operative Paddy-Sale Society was converted into a Cooperative Rice Mill in 1927. A Gosaba M. E. School was founded in 1928. A Health Committee was started in 1924. The whole Estate was divided into 12 wards, each under a Commissioner to look after the health and sanitation of the locality. Even a trained midwife was appointed in 1927 to attend maternity cases and educate the illiterate women-folk of the Estate in maternity and child welfare. A dispensary under a properly qualified doctor was opened at Satjelia in 1929. Three charitable dispensaries were also established on the Estate.

A memorable achievement of Sir Daniel was the inauguration of 'Dharmagolas' in every village to which the village-folk contributed buted their share of paddy. Sir Daniel himself contributed several hundred maunds of paddy from his own Estate to the 'Dharmagolas' which, it is needless to say, grew into decent reserves against any unforeseen calamity such as famine or drought.

Sir Danial also encouraged the people of the Gosaba Estate to insure their lives with the Cooperative Insurance Society, started in Calcutta. Sir Daniel's idea was to make the village-people aware of their future, rather mindful of their old-age maintenance, through their membership of the Insurance Society.

Nor was Sir Daniel indifferent to the development of industries in the Gosaba Estate. To develop weaving industry he appointed an expert from the Serampur Weaving Institute, with the result that in three years 30 looms were in working order and a weaving school was founded. Sir Daniel even encouraged the villagers to grow cotton on their homestead land for their clothings.

To ensure the supply of pure mustard oil to the local people, Sir Danial directed the villagers to fix' Ghanis' (mustard-seed-pressure machine) with the Rice Mill Machineries, promising to advance the cost of Ghani without interest from his Estate Account and agreeing to reimburse himself from the profit of the oil business. A pair of Ghanis were accordingly fixed with the Rice Mill machinery, which facilitated the supply of pure mustard oil to the local people.

Sir Daniel was not unmindful of a Reading club for the officers and educated people of the Estate. Lady Hamilton contributed liberally to the fund of the club. [18]

Rabindranath Tagore heard of Sir Daniel and of his tireless efforts to educate the village-folk of the Gosaba Estate to live in a society modelled on cooperative system. Overwhelmed by the stupendous success of Sir Daniel's rural reconstruction project, Tagore invited him as the President of an annual conference at Sriniketan in 1929. Tagore also paid a return visit on invitation by Sir Daniel to Gosaba on 29 December 1932. Their ideas and ideals regarding rural reconstruction did not clash. [19]

Tebhaga agitation (1946-50) : Closely bearing on the economic life of the Sundarbans people is the agitation of the Bargadars for obtaining a two-thirds share of the paddy produced on the landowners' soil.

The reclamation policy of the Colonial Government was to lease out reclaimed lands in Lots to the highest bidders, who included big business men, barristers and advocates of Calcutta, and some zamindars like Manindra Chandra Nandi of Casimbazar and others. All such persons were called Lot-owners or Lotdars or Izaradars. They were all absentee landlords who preferred to stay away from the unhealthy, inhospitable Lot areas, leasing out their Lots in their turn to others who came to be introduced as 'Chakdars' who owed a certain amount of land-rent to their masters, the Izaradars. It was these Chakdars who held the real sway over the reclaimed lands of the Sundarbans. The Chakdars, again, preferred to live away from the landed-estates like their masters, thereby making fresh arrangements of lease with a class called Big raiyats or Jotdars on whom devolved the primary responsibility of getting land cultivated with the help of ordinary raiyats or Bargadars and Kshetmajurs or farm-labourers. The Jotdars became the de facto landlords of the Sundarban lands.

The Bargadars who were the real men behind the plough were engaged in cultivating land on 50 : 50 basis of crops being shared between them and the Jotdars, their immediate lords. The Jotdars turned out to be the oppressors of the Bargadars. The instruments of oppression employed by the Jotdars were Nayebs, Managers and Gomasthus.

The Bargadars were landless. They had no right to the lands they cultivated. They were liable to eviction any time from their lands by the Jotdars at their sweet will and pleasure. This constituted a major complaint of the Bargadars. The Bargadars demanded that if the Jotdars were unwilling to bear half the cost of production, two-thirds of the paddy produced must be given them (Bargadars) as their share, which was, however, unacceptable to the Jotdars.

As recorded by A. C. Lahiri in his Final Report on the Survey and Settlement Operations in 24-Parganas (1924-33), the condition of the landless labourers, 24-Parganas, particularly of the Sundarbans, was 'wretched'. In the Sundarbans they cultivated the landlords' lands on 'bhag' system which denied them any tenancy right to the land. The paddy they harvested was stocked in the Landlords' own barns. Their share, left after giving the landlords their half share and after deducting previous debts to them, hardly

sufficed to maintain their families for more than 3 or 4 months a year. This necessitated that the landless labourers should move out of their villages to earn their living for the remaining months of the year. Again, the low prices of crops–jute in particular– being saleable only at the rate below the cost of production told heavily on the economy of the cultivators.

They could not also be the beneficiaries of the advantages arising out of the expansion of industries up and down the Hooghly river and the increase of facilities for communication with the distant parts of the district. It was the non-Bengalees who cashed in on such advantages, with the result that the economic condition of the local cultivators did not improve in spite of industrial development. House to house enquiries during the course of the Survey and Settlement operations (1924-33) into the economic condition of 2,497 agricultural families consisting of 12,424 members occupying 130 villages both in the Sundarbans and non-Sundarban areas, revealed that their total income stood at Rs. 9,75,376 as against their total expenditure amounting to Rs. 10,05,516. The enquiries further established that out of the, 2,497 families 187 were on starvation level or that about 7 per cent of the families starved. The poverty of the agricultural families during the period of Survey and Settlement is further evident from their indebtedness, an approximate estimate of which may be obtained from the number and valuation of their mortgages and sale-deeds. Some of the mortgages were, in reality, according to the Survey Report, downright sales. Yet they show the volume of the credit of the cultivators. The average debt of the agriculturists amounted to Rs. 23 per head. Indebtedness besides,the realization of abwabs (additional, unauthorized taxes) caused further hardship to them. The abwabs were more numerous in the Sundarbans area of South 24-Parganas than in its northern part. [20] Abwabs were collected from the unwilling cultivators on different occasions and under different excuses: To give some illustrations— when a Jotdar assumed charge of the Zamindari (Gadi), the Bargadars were required to pay 'Selami'. The Bargadars were to give extra paddy to meet the educational expenses of the Jotdar's son; they were also to give extra paddy in the month of 'Agrahayan' for the entertainment of his relatives at his residence, so on.

After meeting the demands on account of abwab, after paying compound interest on the previously floated loans and after clear-

ing the loan of paddy and cereals taken in advance on Duno, Dera, and showa (2, 1½, 1¼) basis, the Bargadars had little or nothing left to them out of their 50 per cent share of the produce for their maintenance, which compelled them to run into debts. If the Bargadars lived in extreme poverty, the condition of the agricultural labourers was obviously even worse. The prevailing climate foreshadowed a coming storm, particularly in Kakdwip, as would be evident from what was reported on 24 June 1946 by the S. D .O., Diamond Harbour, to the District Magistrate, 24-Parganas.[21] The main problem of the Bargadars, according to the report, was the possibility of their eviction from a plot of reclaimed land almost immediately after its cultivation with paddy and their rehabilitation on another plot for fresh sowing of seeds. They were, again, transferred to another plot for fresh seed-plantation after the cultivation of the previous land was over, in a continuous process, with the result that the Bargadars were ever haunted by the spectre of eviction by the Jotdars who are quite averse from allowing the Bargadars to acquire permanent right to a plot or plots of land . Moreover, the Jotdars' Nayebs and Gomasthas claimed and realized perquisites from the Bargadars while allotting lands to them. Thus had the zamindari of the Jotdars and their 'fraternities in evil' — the Nayebs and Gomasthas been converted into a sort of paradise where Selami or perquisites were easily obtainable. Bargadars were, again, required to construct or repair 'bunds' at their own cost to prevent the ingress of saline water of the estuarine rivers, so harmful to paddy cultivation. Again, in cases where the Lotdars had sanctioned Rs.8 or Rs.10 wages for 1000-foot of ground-digging, the Nayebs and Gomasthas got the work done by Bargadars for Rs.4 or Rs.5, the balance being appropriated to themselves as their perquisites.

The prices of the agricultural commodities began to soar high since about the middle of the thirties of the present century, the prices reaching the maximum level during the famine of 1943. But the Bargadars could not reap the benefit of such inflationary condition as they had no excess amount of commodities to sell. Again, an increase in the price of paddy indirectly meant an increase in the amount of the repayable debt.

All such factors led to an explosive situation, particularly in Kakdwip where the Bargadars demanded two-thirds of the paddy produced, the Bargadars receiving two shares and the owner of the land, one share of the produce, out of the 3 shares.

The centres of agitation were at Budhakhali, Layalganj, Siplat, and Chandanpidi, all under Kakdwip Police Station, and also at Sandeshkhali.

Behind the Tebhaga movement was the leadership of the Kishan Sabha fed by the iron determination of the peasants to fight to the last to break through the cordon of Jotdar's conspiracy against them. Kishan Sabha or the Peasanta's Union was formed in a few provinces between 1933 and 1935. The Kishan Sabha did not organize any major peasant struggle in 1945-46. The 1946 Conference of Kishan Sabha, held in Maubhog village in Khulna, did not give the call for launching the Tebhaga movement, although it duly adopted a resolution demanding the abolition of zamindari and the introduction of tenancy legislation conceding two-thirds share of the crops to the Bargadars. (22) The Bengal Provincial Kisan Sabha decided to launch the Tebhaga movement in the harvesting season in 1946. The Kishan Sabha held meetings in villages, enrolled volunteers, and distributed leaflets calling upon the Bargadars to store paddy in their Khamars and to demand Tebhaga. Between December 1946 and January 1947, the Tebhaga movement spread to 19 districts of undivided Bengal such as Dinajpur, Rangpur, Jalpaiguri, Malda, Bogra and others. (23) The agitation was intense in some pockets of Midnapur, and in Kakdwip and Sandeshkhali in the Sundarbans area.

Inspired by the Communist workers, the peasants of Kakdwip enrolled themselves as members of the Kisan Sabha and got ready for fuelling an agitational movement, demanding two-thirds of the crops raised. The farm-laboures also claimed an increase in their wages. Of the two rival camps in the movement, one included the Bargadars and farm-labourer, mostly Santals, armed with bows, arrows and bamboo sticks (lathis), while the other included the government police-force, armed with guns and radio sets, British judges and magistrates, Congress Sevadal supported by numerous 'goonda' class of people, and the Lotdars and Jotdars, supported by lathials.

Lalganj : The peasant movement in Kakdwip began in the harvesting season of 1948. The landing of the 500 armed police-force from 9 boats at Kakdwip on the early morning of 6 November 1948, gave the signal for the commencement of the struggle between the two rival camps. At Lalganj, in the course of the armed struggle that followed, Jotdar, Kangal Haldar of Sivarampur village, and his henchman, Kunja Ganta, made an attempt to cut the

crops of the land but met serious opposition from the Bargadars and the Santal labourers. Kangal Haldar was killed on the 'battle field' while the others of his camp took to their heels, leaving victory in the hands of the Bargadars. Meanwhile, the peasant fighters occupied all the Cutcharies of the Jotdars in Lalganj which came to be declared a 'free area'. Formerly known as Loilganj, it was re-christened as Lalganj as a free area where over each house-top there now fluttered the red flag of the Communists. A new order was now established in Lalganj after the forcible occupation of the Kutcheries of the Jotdars like Dwarik Samanta, Aditya Samanta, Pulin Das and Krishna Majumdar and after the seizure of 5,000 bighas of land from the Congress government. On 10 August 1949, it was declared by the 'Sangram Committee' at a gathering that Lalganj was now freed from the clutches of Lotdars and Jotdars, that nobody here was a Bargadar but that lands belonged to them all. All would henceforth freely cultivate their land with full control over the crops produced. Above all, people would have their own court and own laws to follow. The court at Lalganj began to function with effect from 15 August 1949.[24]

Chandanpidi : [25] Chandanpidi is another unforgettable name in the history of the Tebhaga agitation. 150 Bargadar families and their supporters, the farm-labourers, commenced the struggle against the vested interests with the ideal of declaring their village a free area like Lalganj, under the leadership of Gajen Mali, Gajen Bhungia, Aswini Das and others. As in Lalganj, lands were distributed among the Bargadars and farm-labourers while the volunteers became responsible for giving them protection against the counter-attack of the rival camp, The counter-attack inevitably followed in no time. The Officer-in-Charge of the Kakdwip Police Station invaded Chandanpidi with 15 sepoys armed with rifles. Counter-attacks were made even by women-folk with their traditional implements like choppers, scythe-like tools, and broom-sticks. Among them were Ahlya who was then carrying seven or eight months, Sarojini, Batasi, and Uttami and 10 others, all of whom offered stiff resistance to 36 police forces. The valiant women fighters were joined by Aswini Das and 15 others armed with bows, arrows, lances, and clubs. It was a trial of strength between two unequally matched camps. The inevitable followed. Aswini along with his sister, Sarojini, came to be killed. Ahlya was shot dead. Batasi and Uttami also were killed in their fight with the Police force and Gorkha soldiers. Still the

fight con-tinued till the paddy-fields became red with the blood of the valiant fighters fighting for their economic freedom.

Meanwhile, 200 volunteers reached from Lalganj to the help of the Chandanpidi fighters. The District Magistrate and Police Commissioner also reached Chandanpidi with 500 Gorkha soldiers. Amidst police and Gorkha atrocities 20 women fighters cut the entire crop from the local paddy-fields while the rival camp stood flabbergasted.Unheard-of retaliation followed. Gajen Mali was arrested and inhuman troture played its role well in bringing the situation under control. And yet the conquered remained unconquerable. The immortal souls of the martyrs like Aswini, Ahlya, Batasi, Uttami, and Sarojini could have inspired their successors like Miltonic Satan with the undying spirit of remaining unsubdued:

> 'What though the field be lost ?
> All is not lost; th' unconquerable will,
> And study of revenge, immortal hate
> And courage never to submit or yield,
> And what is else not to be overcome;
> That glory never shall His wrath or might
> Extort from me: to bow and sue for grace
> with suppliant knee, and deify His power.'
>
> (Paradise Lost, Book I)

Indeed, all was not lost. The movement of Lalganj and Chandanpidi left hot ashes which, when stirred, flared to a blaze.

The storm spread to Budhakhali which like Chandanpidi and Lalganj constituted a Mauza where 65 per cent of the families lived in poverty. Again, 64·29 per cent of such families were Bargadars. No wonder, the entire peasantry of Budhakhali participated in the struggle for Tehaga. According to the report of a Communist organizer, the Tebhaga movement had a popular support mainly in the Budhakhali village in Kakdwip. The Kisans of Budhakhali continually confronted the Police camps. Their ideal was not to ensure Tebhaga only; they planned to bring the entire crop to their own house. (26)

In the first phase of the Budhakhali struggle in 1946-47, hundreds of peasants armed with spears, lances, axes etc. gathered on the paddy fields to collect $^3/_4$ ths crops for their own barns. In this venture they were assisted by the women-folk whose armoury was composed of broomsticks, scythe- like tools, chilly-powder etc. The

Jotdars helplessly looked on. But in the second phase of the struggle in Budhakhali, the Jotdars retrieved their position and offerd counter-offensive, supported by the police-force armed with rifles and Congress Sevadal. They threw themselves upon the traditionally armed peasants, about 300-400 in strength. In the course of the deadly conflict which ensued many lost their lives, including a 19-year old pregnant house-wife, Pakhi by name. (27) On the night of 15 December 1948, 50 policemen, Jotdars, and Congress Sevadal raided the houses of many Bargadars including Nandapati, Bihari, Gabua Haldar, Sibu Mondal, Haris Mondal, and others and committed violence on their families. Nilkantha, Suren, and Sudhir lost their lives in the course of harvesting paddy on 30 and 31 December. Budhakhali was on flames. Though on the brink of annihilation, they still thought that all was not lost. They also counter-attacked the forces of opposition. Many policemen, goondas, and Bihari Mondal of Congress Sevadal were killed by them. (28)

Sandeshkhali : Trouble started in March 1947 in Sandeshkhali, a Mauza under Canning Police Station. Unlike in Kakdwip, in Sandeshkhali, the battle was fought not on the paddy-field at the harvesting winter season but in the Jotdars' barns and Kutcheries. The main objectives of the struggling peasants were to occupy the Jotdars' khamars and to loot paddy. They had to face retaliation from the police and army. Seven were killed in the village of Bermajur, 3 jumped into the river and the condition of 5 more was precarious.(29) 200 armed police-force were deployed for taking retaliatory measures against the peasants. At the time movement started, Hindu-Muslim riots began in urban areas but in villages just as the Hindu and Muslim peasants maintained their unity in the face of their common goal, namely Tebhaga, so did the Hindu and Muslim Jotdars remained united in their common opposition to the peasants struggling for Tebhaga. The movement, however, did not ultimately succeed. Among those who lost their lives mention may be made of Rabiram Sardar, Paglu Sardar, Chamu Bishal, Biru Sardar, Ratiram Sardar, and others. One of the leaders of the Sandeshkhali movement, Hemanta Ghosal, is reported to have said that the moral achievements of the Sandeshkhali movement were greater than its material achievements. (30) Agrarian disturbances born of peasant discontent added a new dimension to the political movement of the country.(31)

Sandeshkhali movement failed. So did fail the Kakdwip movement by 1950. 'In Party literature', writes Sunil Sen, 'Kakdwip was described,somewhat misleadingly,as a Sishu Telingana (baby Telingana). It would probably be accurate to say that the Kakdwip struggle was a partial struggle which remained confined to a small area'. (32)

The fact remains that the landless peasants (Bargadars and farm-labourers) entered into a life-and-death struggle with the rapacious Lotdars and Jotdars of Lalganj, Chandanpidi, Budhakhali (all in Kakdwip) and of Sandeshkhali between 1946 and 1950 for asserting their claim to $^2/_3$ rds of the paddy produced and for preventing their illegal and wilful eviction from land.

Initially the policy of the Government was to repress the movement by stringent measures, to stop it for good by iron hand. No attempt was made by government to solve the problem on a legislative footing. The Muslim league Ministry could no longer ignore the widespread unrest in the 19 districts and the Bengal Bargadars TemporaryRegulation Bill was published in Calcutta Gazette Extraordinary on 22 January 1947. According to the provisions of the Bill, in such cases where the Jotdars supplied plough, cattle, and any other agricultural implements, and manure, the Bargadar would get half the produce. The Jotdar could evict the Bargadar if he wanted to cultivate the land himself with the aid of the members of his family. The Bargadar could also be evicted if he failed to cultivate the land properly or if he failed to deliver to the owner such share of the produce as he was bound to deliver by the provisions of the Act. 'Thus the Bill practically conceded the Tebhaga demand for which the peasants had been clamouring.' (32A)

This was followed by a new development. In many villages the Bargadars had stored the paddy in the Jotdars' Khamar. 'The Kholan bhanga movement' started as the Bargadars thought it wise to remove the paddy stored in Jotdars' barns. As the movement began from early February 1947, Government adopted repressive measures to stop it, thus bringing upon itself the allegation that it was responsible for sabotaging the Bargadars Bill. (33)

In 1950 was passed the West-Bengal Bargadari Act designed to settle the disputes between the Jotdars and Bargadars.The share of the produce remained at 50:50 basis. In 1954, Government passed an ordinance, banning illegal eviction.(34) This was followed by Land Reforms Act, 1955, which received President's assent in

March 1965. The Jotdars were brought within the purview of the Act. Interests of the Bargadars were also safeguarded by the provisions of the Act. The produce-rent recoverable from them was reduced from 50 to 40 per cent. The paddy would be stored in such a place as might be agreed upon by the Jotdars and land-owners. The Act imposed a ceiling on the holding of a raiyat at 25 acres. This provision did not apply to orchards and to the lands held by religious instititions and trusts. But eviction of the Bargadars continued unabated and tenancy legislation was undertaken in the 1970s to protect the interests of the Bargadars. [35] Old Bargadars could not be evicted in the interests of the new ones, according to a legislation of the United Front Government of West Bengal.

The Tebhaga movement though arrested by bureaucratic measures was not wholly abortive. It met the demands of the bargadars at least partially.

Lastly, from the role of the Bargadars and farm-labourers – all from the peasant families in the Tebhaga movement, it stands clear that peasants, if properly guided, have possibilities of a revolutionary force. This is what Marxists tell us. They go one step further by stressing the need for the peasant-worker alliance for a successful change in status quo. It will be doing gross injustice to the Indian peasants and under-estimating their possibilities if they are looked upon as ineradicably meek and docile and are portrayed as wearing faces on which are writ large the centuries-old stories of pathos and agony and as trudging at a wearied pace with whatever load put on their backs as long as there is the last breath in their nostrils.

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CHAPTER-V

Social Structure – Social Life

Mainly a rural terrain interspersed with developing urban or semi-urban centres, the Sundarbans present the picture of a country which is populated largely by backward classes and by a minority of upper-class people professing diverse religious faiths. The people are of intrepid, hard-working and painstaking nature, mostly landless and, therefore, dependent for their livelihood on wood-cutting, fishing, and honey-wax collection, braving the deadly attacks of man-eating wild animals like tigers and crocodiles. Their social life obviously knows no easy or smooth sailing in face of such risks to life, thousand and one odds and inconveniences including want of drinkable water, and lack of communication facilities, opportunities for higher education and expert medical treatment. There are also great challenges of Nature in the form of quakes, floods, storms, and cyclones. And yet the people have cultivated *sang froid*, have learnt to live in harmony with Nature and in co-existence with wildlife, have, in short, acquired the secrets of the much-needed adjustment to their existing social structure. They have built up a society based on communal existing harmony and upon a blend of both Hindu and non-Hindu cultures. With stoic patience, they submit to all the untowardnesses of life, perhaps, as their destiny, ordained by the Supreme Being — 'Shall we receive good at the hands of god, And evil not receive ? [1]

Class or Caste composition of society : Scheduled Castes and Scheduled Tribes

The Sundarbans society is traditionally built upon the hierarchical organization of different classes or castes of people ranging from the upper-class Hindus and low-class Hindus, including the backward classes or Scheduled castes and Scheduled tribes, to the non-Hindus as well like the Muslims of the Sunni sect, the Buddhists (Mugs from Arakan) and a few families of native Christians.

The 1981 census operations in the district of the South 24-Parganas record the following percentages of population on religious basis.

Name of Police Stations	Buddhists	Christians	Hindus	Muslims
Canning	—	0·30	60·47	39·23
Basanti	—	3·51	63·42	33·07
Jaynagar	—	0·01	62·54	37·45
Kultali	—	0·60	77·02	22·38
Kulpi	—	0·42	71·62	27.96
Mandirbazar	—	0·89	73·26	25·85
Mathurapur	—	1·56	80·72	17·72
Patharpratima	—	0·16	92·67	7·17
Kakdwip	0·01	0·06	86·08	13·85
Sagar	0·01	0·04	90·93	9·02
Namkhana	—	0·02	89·09	10·89
Gosaba	—	1·54	91·84	6·62

Among the low-caste Hindus, the Pods in the west and Namassudras in the east of the region are the most numerous. The concentration of backward classes is relatively higher in the blocks of Hingulganj, Hasnabad, Sandeshkhali, Gosaba, Jaynagar, and Kultali.[2] Scheduled castes and Scheduled tribes together constitute 25·61 per cent of the total population of West Bengal as a whole and almost 44 per cent of the total population of the Sundarbans. Originally, the Sundarbans region was the land of the Namassudras who were subsequently driven towards the east by the Paundras. Some scholars, for instance, Atul Sur, are of the opinion that South Bengal was the original home of the Paundras but, according to some others like Sujit Sur, South Bengal might have been the Paundras' old home-land but not their original home-land. [3] They moved from North Bengal by crossing the Padma and settled down in South Bengal. The Paundras (Paundra-Kshatriyas), however, command a large population in the Sundarbans areas. Some social classes, castes, and tribes in the Sundarbans are introduced below in the form of Tables :

Table- I

Names of some classes and castes with reference to Police Stations and villages. (Vide Paschim Banger Puja Parvan O Mela, vol. 3. ed. by Asóke Mitra)

Police Stations	Village	Names of class or caste of peoples resident
1. Hasnabad	Simulia	Brahman, Mahisya, Blacksmith, Paundra,Kshatriya, and Musalman.
	Hasnabad	Brahman, Mahisya, Bagdi, Namassudra and Musalman.
	Rameswarpur	Hindus, Musalmans.
	Ichhapur	Brahman, Bairagi, Vaisya Kapali, Musalman.
2. Hingulganj	Kanaknagar	Mahisya, Pod.
	Bankra	Hindus, Musalman.
3. Sandeshkhali	Deknamari	Mahisya, Bagdi, Pod, Munda, Oran.
	Nyazat	Hindus, Oran, Mundas.
	Sandeshkhali	Mahisya, Paundra-Kshatriya, Munda, Sardar (Santal).
	Hatgachha	Brahman, Paundra-Kshatriya, Musalman, Munda, Oran, Ghasi.
	Sitaliya	Paundra-Kshatriya, Musalman.
	Jayagopalpur	Caste Hindu, Scheduled Castes and Scheduled Tribes, Musalman.
4. Haroa	Haripur	Hindu, Musalman.
	Uchildaha	Brahman , Mahisya, Pod, Tanti (Weaver), Namassudra, Muchi (Cobbler) Khandait, Sreshthikaran, Tribals.
	Haroa	Hindus, Muslims.
5. Minakhan	Malancha	Brahman, Bairagi, Napit (Barbar), Kamar(Blacksmith), Jele (Fisherman) Bagdi, Paundra-Kshatriya, Musalman.
	Bamanpukuria	Brahman, Kayastha, Mahisya, Paundra, Kshatriya, Namassudra, Dhopa (Washerman), Musalman, Kamar (Blacksmith), Christian.

Police Stations	Village	Names of class or caste of peoples resident
6. Jaynagar	Dosha	Paundra-Kshatriya, Bagdi, Bairagi, Oriya.
	Govindapur	Hindu, Musalman.
	Baharu	Brahman, Kayastha, Kaora, Bagdi, Musalman.
7. Kultali	Nalgora	Brahman, Kayastha, Mahisya, Paundra, Kshatriya, Kaora, Bagdi, Muchi (Cobbler), Dalui, Musalman.
	Sonatikri	Hindu, Musalman, Christian, Tribals.
8. Canning	Canning	Brahman, Kayastha, Vaidya, Paundra-Kshatriya, Mahisya, Muchi (Cobbler), Namassudra, Musalman.
	Taldi	Hindu, Musalman.
	Davis Abad	Paundra-Kshatriya Barber, Rajbansi, Musalman.
	Ray-Baghini	Hindu, Musalman.
	Ghutiari Shariff	Musalman.
9. Basanti	Umjhara	Brahman, Mahisya, Bairagi, Paundra-Kshatriya, Bagdi, Kaora, Muchi (Cobbler), Musalman.
	Bharatgarh	Hindu, Musalman, Christian, Tribals.
10. Mandirbazar	Siddheswarpur	Brahman,Mahisya, Paundra-Kshatriya, Kamar (Blacksmith), Musalman, Dhopa (Washerman).
	Vidyadharpur	Brahman, Paundra-Kshatriya, Kamar (Blacksmith), Dhopa (Washerman), Kaora, Muchi (Cobbler)-all living in 10 Paras or localities such as Haldar-para, Sardar-para, Mandal-para, Purkait-para, Kamar-para, Dhopa-para, Bene-para, etc.
	Purvagopalnagar	Brahman, Kayastha, Mahisya, Paundra-Kashatriya, Gope, Kamar (Potter), Goldsmith, Barber, Kaora, Cobbler, Musalman.
	Purva Vishnupur	Brahman, Kayastha, Mahisya, Sadgope, Kaora - 3 localities: Brahman-para, Mahisya-para, Kaora-para

Police Stations	Village	Names of class or caste of peoples resident
11. Kulpi	Deria	Brahman, Kayastha, Mahisya, Paundra- Kshatriya, Blacksmith, Potter, Barber, Dhopa, Musalman.
	Shyam Basu's Chak (Mauja : Chhota Monoharpur)	Mahisya, Dhopa, Barber , Kaora, Musalman.
	Udairampur	Kayastha, Sadgope, Dhopa, Kshatriya, Musalman.
	Durganagar	Mahisya, Paundra-Kshatriya, Dhopa, Barber, Bagdi.
12. Mathurapur	Uttar Govindapur	Brahman, Vaisya, Paundra-Kshatriya, Satchashi.
	Gilab Chhat	Brahman, Mahisya, Paundra-Kshatriya, Dalui, Kaora, Dhopa, Barber, Blacksmith.
13. Patharpratima	Digambarpur	Brahman, Mahisya, Weaver, Washerman, Goldsmith, Pod, Milkman, Fisherman, Potter, Bagdi, Teli, Kayastha, Barber, Dalui, Cobbler.
	Kamdevpur	Brahman, Bairagi, Mahishya, Paundra-Kshatriya,Weaver, Fisher man, Bagdi, Dalui, Santal.
	Radhanagar	Brahman, Weaver, Potter, Carpenter, Oilman, Fisherman, Barber,Cobbler, Namassudra.
14. Kakdwip	Sitarampur	Hindu, Musalman.
	Madhabnagar	Brahman, Paundra-Kshatriya, Kaora, Washerman, Barber.
	Manmathapur	Mahisya, Goala (Milkman) Weaver, Carpenter, Potter, Namassudra, Bagdi, Muchi, Munda.
	Mrinalnagar	Brahman, Kayastha, Fisherman, Milkman, Barber, Washerman, Cobbler, Munda.
	Manipur	Brahman, Mahisya, Bairagi,Chamar, (Tanner), Barber, Musalman.

Police Stations	Village	Names of class or caste of peoples resident
15. Namkhana	Amarabati	Brahman,Bairagi,Mahisya,Paundra-Kshatriya, Dalui, Blacksmith, Washerman, Barber, Huri, Kaora.
16. Sagar	Silpara (Mauja Muriganga)	Brahman, Mahisya, Paundra-Kshatriya, Dalui, Fisherman, Namassudra.
	Mritunjaya-nagar	Brahman, Bairagi, Potter, Weaver, Fisherman, Namassudra, Washerman, Mahisya, Paundra-Kshatriya, Musalman.
	Sumati-nagar	Brahman, Mahisya, Potter, Paundra-Kshatriya, Muchi, Teli, Musalman.
	Lalpur (Mauja Manasadwip)	Mahisya, Karan, Milkman, Weaver, Paundra-Kshatriya.
	Beguakhali	Paundra-Kshatriya, Kaora,Scavenger, Mahisya, Musalman.

Table - II

A List of Scheduled Castes and Scheduled Tribes in the Sundarbans:

(a) Some Scheduled Castes (Ref. Census of 1961, District Handbook 24-Parganas, vol.I, p. 540).

Bagdi, Bediya, Bhuiya, Chamar, Karmakar, Muchi, Rabidas, Dhopa, Dosadh, Ghasi, Dom, Huri, Jalia Kaibarta, Ghalo Malo or Malo, Kadar, Kaora, Koch, Lohar, Mahar, Mal, Mullah, Namassudra, Pod, Rajbanshi, Sunri (excluding Saha), Tiyar, Turi, Kaur, Keot, Bauri, Nuniya, Rajwar, Methar, Etc.

(b) Some Scheduled Tribes (Ref. Census of 1961, District Handbook, 24-Parganas, vol. II & I)

Munda, Santal, Oran, Bhumij, Mahali, Kora, Mal Pahariya, Nages, Rabha, Chakma, Garo, Ho, Lodha, Kheria, Magh, etc.

Table — III

(a) Distribution of some Scheduled Castes
(Reference: Census of 1961, District Handbook, 24-Parganas,vol. II, pp. 42-43).

Name of Scheduled Castes	The Police Stations under which they live
Pod	Gosaba, Jaynagar, Hingulganj, Canning, Mathurapur, Sandeshkhali, Mandirbazar, Hasnabad, Kulpi, Minakhan.
Namassudra	Canning, Basanti, Haroa, Mathurapur, Sandeshkhali, Kulpi, Sagar, Kakdwip, Minakhan, Mandirbazar.
Rajbanshi	Hasnabad, Haroa, Basanti, Sandeshkhali, Kakdwip, Bhangar, Kulpi, Patharpratima, Minakhan, Jaynagar, Gosaba.
Bagdi, Duley	Mathurapur, Canning, Patharpratima, Sandeshkhali, Jaynagar, Kulpi, Mandirbazar, Haroa, Kultali, Sagar, Hasnabad, Namkhana, Gosaba.
Kaora	Mathurapur, Mandirbazar, Kulpi, Canning, Sandeshkhali, Patharpratima, Kultali, Kakdwip, Basanti, Haroa.
Chamar	Hasnabad, Haroa, Jaynagar, Kulpi, Sandeshkhali, Mandirbazar.
Dhopa	Mathurapur, Kulpi, Mandirbazar, Patharpratima, Kakdwip, Sagar, Kultali, Haroa, Namkhana.
Tiyar	Mandirbazar, Jaynagar, Kulpi, Hasnabad, Kultali, Canning.

The Pods constitute the major Scheduled Castes in the 24-Parganas, forming 47·74 per cent of the total Scheduled Caste population of the district, according to 1961 census. Numerically Namassudras come next to Pods. Next to the Namassudras, Rajbansis command the largest percentage among the rural Scheduled Castes of the district. Bagdi-Duley and Kaora come next. Numerically, Dhobas, Tiyar, Jalia Kaivarta, Jhalo Malos or Malos

are next in order in the rural sector. In the urban areas of the 24-Parganas, according to 1961 Census, Namassudras form the major Scheduled Castes. Next come, in order of numerical strength, the Chamars, Dhoba, Pods, Bagdis, Duleys, Rajbansis, Jalia, Kaivarta, Methors, Kaoras, Huri, Mal, Bauri, Rajwar, etc.

Table — III (continued)

(b) Distribution of some Schedules Tribes : (Reference: Census of 1961, 24-Parganas District Handbook, vol. II, pp. 60-)

Name of Scheduled Tribes	Police Station under which they live
Munda	Sandeshkhali, Gosaba, Canning, Hasnabad, Hingulganj, Basanti, Kultali, Bhangar, Mathurapur, Haroa, Sonarpur, Kakdwip, Patharpratima, Minakhan. The Mundas live mostly (64.12 per cent of the total Munda population, according to 1961 Census) in Sandeshkhali, Basirhat Subdivision.
Santal	Haroa, Canning, Hasnabad, Sandeshkhali, Gaighata, Gosaba Basanti, Sagar, Kultali, Patharpratima, Mandirbazar, Namkhana, Hingulganj, Rajarhat. The Santals live mostly in Haroa Police Station in Basirhat subdivision.
Oran	Sandeshkhali, Canning, Gosaba, Minakhan, Basanti, Kultali, Hasnabad, Hingulganj. The Orans live mostly in Sandeshkhali Police Station Basirhat, Subdivision.
Bhumij	Sandeshkhali, Gosaba, Canning, Hasnabad, Haroa, Kultali, Basanti, Hingulganj, Mathurapur, Minakhan. The Bhumij tribal population live mostly under Sandeshkhali Police Station (Basirhat S.D.) where they form 40·85 per cent of the total Bhumij population of the district.

Mahali	Minakhan, Gosaba, Sandeshkhali, Haroa, Hasnabad. The majority of the Mahalis (35.38 per cent) lives under Minakhan Police Station.
Kora	Sandeshkhali, Mathurapur, Basanti, Gosaba, Jaynagar, Minakhan. The Koras live mostly under Sandeshkhali Police Station where they form 40·36 per cent of their total population living in the district.
Mal Pahariyas	They live mostly in Barasat Subdivi-sion. Under Basanti Police Station, 7·25 per cent of the Mal Pahariyas live.

Of the Scheduled Tribes the Mundas form the major partner. Next to come in order of numerical strength are the Santals, Orans, Bhumijas, Mahalis, Koras, Mal Pahariyas, Nagesu, Rabha, etc.

In the Social organization of the Sundarbans, the Scheduled Castes and Scheduled Tribes obviously occupy a significant place. The census reports contain useful statistics on their literacy and occupational position. Such statistics recorded during the census operations of 1981 and 1991 are presented below, Police-Station-wise, under the following headings in justification of the above contention.

(Vide District Primary Census Abstract for Scheduled Castes only (1981)-24-Parganas District Handbook, 1981).

Scheduled Castes - Literacy and Occupational position, 1981, under the following Headings :

(1) Number of households with Scheduled Caste Members.
(2) Total Scheduled Caste population.
(3) Literates.
(4) Cultivators.
(5) Agricultural labourers.
(6) Those employed in household Industry manufacturing, processing, servicing, repairing.
(7) Non-working.

Scheduled Castes
Literacy and Occupational position, Police Station-wise, 1981.

Police Station			Police Station		
Basanti			***Canning***		
1	—	12,800	1	—	8, 213
2	—	71,500	2	—	1,08,011
3	—	19,516	3	—	30,014
4	—	9,456	4	—	10,942
5	—	8,168	5	—	12,417
6	—	100	6	—	252
7	—	52,157	7	—	78,521
Jaynagar			***Kultali***		
1	—	19,016	1	—	12,527
2	—	1,09,714	2	—	71,410
3	—	33,068	3	—	1,244
4	—	9,372	4	—	103
5	—	10,449	5	—	6,837
6	—	838	6	—	170
7	—	80,783	7	—	51,959
Kulpi			***Mathurapur***		
1	—	10,110	1	—	15,004
2	—	65,534	2	—	84,927
3	—	21,992	3	—	26,520
4	—	4,533	4	—	8,520
5	—	7,529	5	—	8, 743
6	—	279	6	—	467
7	—	47,296	7	—	62,501
Mandirbazar			***Patharpratima***		
1	—	11,157	1	—	8,030
2	—	60,587	2	—	47,357
3	—	19,319	3	—	13,950
4	—	4,135	4	—	5,652
5	—	5,811	5	—	5,413
6	—	543	6	—	77
7	—	45,390	7	—	34,062

Police Station			Police Station		
Kakdwip			***Sagar***		
1	—	8,359	1	—	5,543
2	—	48,538	2	—	30,733
3	—	13,775	3	—	10,272
4	—	4,472	4	—	4,087
5	—	4,978	5	—	2,738
6	—	92	6	—	53
7	—	35,053	7	—	21,953
Namkhana			***Sandeshkhali***		
1	—	3,491	1	—	12,515
2	—	18,704	2	—	74,448
3	—	6,790	3	—	23,899
4	—	2,234	4	—	9,015
5	—	1,608	5	—	9,086
6	—	10	6	—	86
7	—	13,421	7	—	51,845
Haroa			***Hingulganj***		
1	—	7,065	1	—	11, 707
2	—	44,180	2	—	66, 486
3	—	10,799	3	—	24, 561
4	—	4,870	4	—	7, 680
5	—	4,204	5	—	7, 748
6	—	119	6	—	284
7	—	32,459	7	—	46, 766
Minakhan			***Gosaba***		
1	—	4,201	1	—	18,942
2	—	24,307	2	—	1,07,959
3	—	5,462	3	—	30,459
4	—	2,788	4	—	13,924
5	—	2,515	5	—	11,125
6	—	67	6	—	192
7	—	17,981	7	—	77,805

Police Station

Hasnabad

1	—	10,206	5	—	4,837
2	—	55,089	6	—	542
3	—	17,560	7	—	39,623
4	—	5,673			

Scheduled Tribes

Literacy and Occupational position, Police Station-wise, 1981.

District Primary Census Abstract for Scheduled Tribes only (Same reference 1981).

Police Station

Canning

1	—	1,947
2	—	9,905
3	—	27
4	—	—
5	—	2,270
6	—	6
7	—	5,914

Sagar

1	—	85
2	—	418
3	—	—
4	—	—
5	—	51
6	—	—
7	—	278

Basanti

1	—	2,142
2	—	10,792
3	—	14
4	—	—
5	—	2,410
6	—	—
7	—	7,005

Police Station

Kulpi

1	—	1
2	—	7
3	—	—
4	—	—
5	—	—
6	—	—
7	—	—

Sandeshkhali

1	—	3, 391
2	—	48, 933
3	—	6, 454
4	—	5, 490
5	—	11, 020
6	—	7
7	—	28, 089

Mandirbazar — **NIL**

Mathurapur

1	—	467
2	—	2,581
3	—	—
4	—	—
5	—	550
6	—	—
7	—	1,444

Police Station			Police Station		
Namkhana			***Hingulganj***		
1	—	63	1	—	869
2	—	345	2	—	4,310
3	—	—	3	—	532
4	—	—	4	—	437
5	—	32	5	—	864
6	—	—	6	—	1
7	—	242	7	—	2,667
Jaynagar			***Patharpratima***		
1	—	19	1	—	291
2	—	91	2	—	1,540
3	—	40	3	—	—
4	—	—	4	—	—
5	—	19	5	—	250
6	—	—	6	—	7
7	—	65	7	—	1,034
Haroa			***Gosaba***		
1	—	2,179	1	—	3, 094
2	—	11,532	2	—	16, 348
3	—	7	3	—	2, 056
4	—	—	4	—	1, 919
5	—	2,629	5	—	3, 358
6	—	2	6	—	30
7	—	7,170	7	—	9, 899
Kultali			***Kakdwip***		
1	—	843	1	—	201
2	—	3,953	2	—	1,140
3	—	314	3	—	—
4	—	380	4	—	—
5	—	941	5	—	164
6	—	1	6	—	—
7	—	2,509	7	—	735

Police Station			**Police Station**		
Minakhan			***Hasnabad***		
1	—	408	1	—	1,573
2	—	5,053	2	—	6,729
3	—	507	3	—	1,315
4	—	206	4	—	521
5	—	1,171	5	—	1,148
6	—	1	6	—	2
7	—	3,089	7	—	4,363

It is seen from the statistical abstract of the Scheduled Tribes that comparatively high strength of Literates was recorded in Sandeshkhali (6454), Gosaba (2056), Hasnabad (1315), and the lowest strength, in Haroa (7), while the literates were conspicuous by their absence in Kulpi, Mandirbazar, Mathurapur, Patharpratima, Kakdwip, Sagar, and Namkhana. Cultivators were recorded under only 6 Police Stations, namely Kultali (380), Minakhan (206), Hasnabad (521), Sandeshkhali (5490), Hingulganj (437) and Gosaba (1919) whereas in the remaining 11 there were no cultivating families to record. While this was the position with regard to the cultivators, the agricultural labourers represented all the Police Stations excepting Kulpi, the highest figure being recorded in Sandeshkhali (11,020). The poverty-level of the society of the Sundarbans can be assessed from the predominance of the families of landless labourers.

The statistical abstract for the Scheduled Castes also indirectly indicates the greater strength of agricultural labourers than that of the cultivators under the Police Stations of Canning, Jaynagar, Kultali, Kulpi, Mandirbazar, Mathurapur, Kakdwip. The Scheduled Castes are, therefore, in no better economic position. Their poverty level can be assessed from the higher percentage of landless labourers among them. In literacy, the Scheduled Castes were better placed than the Scheduled Tribes.

Scheduled Castes
Literacy and Occupational position, 1991
(Vide Primary Census Abstract, 1991.)

Headings

1. No. of households
2. Total Scheduled Castes Population
3. Literates
4. Total workers
5. Cultivators
6. Agricultural labourers
7. Livestock
8. Mining and Quarrying
9. Manufacturing (Category A)
10. Manufactures (Category B)
11. Construction
12. Trade
13. Transport
14. Others
15. Marginal workers
16. Non-workers

Police Station (R – Rural, U – Urban)

Canning

1	–	R	23,606	9	–	R	323
		U	3,322			U	69
2	–	R	1,30,597	10	–	R	1,452
		U	17,385			U	379
3	–	R	45,087	11	–	R	1,261
		U	7,863			U	209
4	–	R	35,384	12	–	R	2,323
		U	4,671			U	1,143
5	–	R	13,453	13	–	R	634
		U	526			U	260
6	–	R	13,513	14	–	R	2,070
		U	1,025			U	919
7	–	R	347	15	–	R	1,487
		U	137			U	40
8	–	R	8	16	–	R	93,726
		U	4			U	12,674

Police Station			Police Station		
***Basanti* (R)**			***Gosaba* (R)**		
1	–	17,273	1	–	24,114
2	–	94,753	2	–	130,413
3	–	34,753	3	–	61,015
4	–	25,671	4	–	37,071
5	–	12,205	5	–	19,175
6	–	9,750	6	–	13,182
7	–	315	7	–	1,233
8	–	7	8	–	17
9	–	282	9	–	275
10	–	437	10	–	243
11	–	115	11	–	95
12	–	1, 229	12	–	906
13	–	361	13	–	185
14	–	970	14	–	1,760
15	–	3, 595	15	–	9,978
16	–	65, 487	16	–	83, 364
***Kultali* (R)**			***Jaynagar* (R)**		
1	–	12,468	1	–	26,289
2	–	78,642	2	–	1,54,242
3	–	25,093	3	–	57,308
4	–	19,456	4	–	39,094
5	–	8,208	5	–	12,788
6	–	8,919	6	–	15,496
7	–	726	7	–	145
8	–	1	8	–	9
9	–	70	9	–	1,514
10	–	264	10	–	1,791
11	–	68	11	–	388
12	–	506	12	–	3,106
13	–	135	13	–	1,529
14	–	559	14	–	2,328
15	–	1,217	15	–	2,044
16	–	57,969	16	–	1,33,104

Police Station			Police Station		
***Kulpi* (R)**			***Mandirbazar* (R)**		
1	–	12,724	1	–	3,071
2	–	72,447	2	–	75,656
3	–	29,663	3	–	33,979
4	–	17,583	4	–	18,520
5	–	4,792	5	–	4,481
6	–	7,392	6	–	6,327
7	–	671	7	–	25
8	–	15	8	–	46
9	–	499	9	–	859
10	–	839	10	–	911
11	–	160	11	–	242
12	–	1,378	12	–	2,946
13	–	708	13	–	880
14	–	1,129	14	–	1,803
15	–	1,621	15	–	848
16	–	53,243	16	–	56,288
***Patharpratima* (R)**			***Mathurapur* (R)**		
1	–	9,956	1	–	19,731
2	–	60,722	2	–	1,10,994
3	–	9,575	3	–	40,990
4	–	16,040	4	–	28,031
5	–	7,579	5	–	8,858
6	–	6,254	6	–	12,713
7	–	509	7	–	477
8	–	12	8	–	35
9	–	180	9	–	991
10	–	259	10	–	762
11	–	109	11	–	278
12	–	342	12	–	1,570
13	–	201	13	–	1,011
14	–	595	14	–	1,366
15	–	3,633	15	–	2,042
16	–	40,999	16	–	80,921

Police Station		
***Kakdwip* (R)**		
1	--	11.297
2	–	66,799
3	–	22,920
4	–	17,558
5	–	4,876
6	–	5,332
7	–	3,836
8	–	10
9	–	390
10	–	915
11	–	85
12	–	917
13	–	433
14	–	764
15	–	2,637
16	–	46,604

Police Station		
***Sagar* (R)**		
1	–	7,192
2	–	43,250
3	–	19,095
4	–	10,693
5	–	5,240
6	–	3,391
7	–	721
8	–	24
9	–	84
10	–	137
11	–	31
12	–	293
13	–	281
14	–	491
15	–	1,030
16	–	31,527

***Namkhana* (R)**		
1	–	6,406
2	–	36,235
3	–	15,736
4	–	10,226
5	–	4,110
6	–	2,007
7	–	2,397
8	–	26
9	–	163
10	–	270
11	–	47
12	–	404
13	–	280
14	–	522
15	–	5,454
16	–	20,555

Scheduled Tribes
Literacy and Occupational position, 1991
(Vide- Scheduled Tribes Primary Census Abstract, 1991)
Same headings as under Scheduled Castes, 1991
(R = Rural; U = Urban : M= Jaynagar Mazilpur Municipality

Police Station

Canning

1	–	R	2,609	9	–	R	6
		U	31			U	2
2	–	R	13,549	10	–	R	30
		U	132			U	4
3	–	R	2,423	11	–	R	9
		U	47			U	2
4	–	R	5,232	12	–	R	35
		U	41			U	8
5	–	R	1,412	13	–	R	25
		U	1			U	2
6	–	R	3,601	14	–	R	65
		U	11			U	9
7	–	R	48	15	–	R	179
		U	1			U	–
		R	1	16	–	R	8,138
		U	1			U	91

(R)

1	–	2,698	9	–	9
2	–	13,628	10	–	61
3	–	2,199	11	–	10
4	–	4,627	12	–	30
5	–	975	13	–	30
6	–	3,356	14	–	80
7	–	73	15	–	1,245
8	–	3	16	–	7,756

Police Station

Gosaba (R)

1	–	3,909	9	–	19
2	–	19,683	10	–	9
3	–	4,163	11	–	13
4	–	6,998	12	–	30
5	–	2,102	13	–	15
6	–	4,608	14	–	131
7	–	70	15	–	1,757
8	–	1	16	–	10,928

Jaynagar (R)

1	–	R	142	9	–	R	11
		M	3			M	–
2	–	R	872	10	–	R	8
		M	15			M	–
3	–	R	183	11	–	R	1
		M	9			M	–
4	–	R	218	12	–	R	1
		M	2			M	–
5	–	R	59	13	–	R	–
		M	–			M	–
6	–	R	132	14	–	R	6
		M	–			M	2
7	–	R	–	15	–	R	2
		M	–			M	–
8	–	R	–	16	–	R	652
		M	–			M	13

Police Station		
***Kultali* (R)**		
1	–	828
2	–	4,406
3	–	724
4	–	1,472
5	–	315
6	–	1,119
7	–	7
8	–	–
9	–	3
10	–	3
11	–	8
12	–	6
13	–	1
14	–	10
15	–	96
16	–	2,838
***Mandirbazar* (R)**		
1	–	2
2	–	3
3	–	3
4	–	–
5	–	–
6	–	–
7	–	–
8	–	–
9	–	–
10	–	–
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	3

Police Station		
***Kulpi* (R)**		
1	–	1
2	–	3
3	–	–
4	–	3
5	–	–
6	–	–
7	–	–
8	–	–
9	–	–
10	–	3
11	–	–
12	–	–
13	–	–
14	–	–
15	–	–
16	–	–
***Mathurapur – Raidighi* – R**		
1	–	613
2	–	3,146
3	–	788
4	–	1,046
5	–	209
6	–	744
7	–	32
8	–	–
9	–	2
10	–	8
11	–	2
12	–	5
13	–	7
14	–	37
15	–	111
16	–	1,989

Police Station		
***Patharpratima* (R)**		
1	–	290
2	–	1,922
3	–	461
4	–	647
5	–	157
6	–	347
7	–	119
8	–	–
9	–	–
10	–	5
11	–	–
12	–	2
13	–	4
14	–	13
15	–	58
16	–	1,217
***Namkhana* (R)**		
1	–	120
2	–	574
3	–	182
4	–	227
5	–	58
6	–	70
7	–	85
8	–	–
9	–	–
10	–	–
11	–	3
12	–	1
13	–	1
14	–	9
15	–	98
16	–	249

Police Station		
***Kakdwip* (R)**		
1	–	223
2	–	1,131
3	–	226
4	–	333
5	–	153
6	–	139
7	–	3
8	–	3
9	–	1
10	–	1
11	–	5
12	–	10
13	–	9
14	–	9
15	–	47
16	–	751
Sagar (R)		
1	–	101
2	–	546
3	–	226
4	–	178
5	–	73
6	–	67
7	–	12
8	–	–
9	–	–
10	–	2
11	–	2
12	–	1
13	–	4
14	–	17
15	–	17
16	–	351

It appears from the above analysis of the Scheduled Castes employed in different occupations in 1981 and 1991, the population of agricultural labourers exceeded that of the cultivators under the Police Stations of Jaynagar, Kultali, Kulpi, Mandirbazar, and Kakdwip. If the excess of agricultural labourers over the cultivators be an index of the general level of poverty, the economic condition of the people under the above Police Stations did not improve in the decade of 1981-91.

As regards the Scheduled Tribes, cultivators were recorded under such Police Stations as Canning, Basanti, Gosaba, Jaynagar, Kultali, Mathurapur, Patharpratima, Kakdwip, Sagar and Namkhana, their strength ranging between 58 (Namkhana) and 2,102 (Gosaba). The agricultural labourers were recorded in Canning, Basanti, Gosaba, Jaynagar, Kultali, Mathurapur, Patharpratima, Kakdwip, Sagar and Namkhana, their strength ranging between 67 (Sagar) and 3,612 (Canning). As regards literacy, among the Scheduled Tribes, literates were recorded in Canning (2,470), Basanti (2,199), Gosaba (4,163), Jaynagar (192), Kultali (724), Mathurapur (788), Patharpratima (461), Kakdwip (226), Sagar (226), Namkhana (182), Mandirbazar (3) only. No literates were recorded in Kulpi.

Migration

If the backward classes like the Scheduled Castes and Scheduled Tribes, as discussed above, constituted significant parts of the Sundarban population, the migrants who commenced pouring into the region since the beginning of reclamation formed no less significant ingredients of the social composition of the reclaimed areas. Such migrants as hailed mainly from Chhotonagpur (sending out Orans and Mundas), Hazaribagh, Manbhum, Bankura, Birbhum, Balassor, North 24-Parganas, Nadia, Jessore, Midnapur (Tamluk, Contai) were needed most and welcomed heartily for the dual purpose of reclaiming the forest areas, by clearing jungles and dressing the land for their cultivation of paddy. Then came the waves of migrants in the wake of the partition of India in 1947 and the Bangladesh Liberation struggle in 1971. Many such migrants (mostly Hindus) who were in search of refuge from the atrocities of alien neighbours and alien government settled down in the Sundarbans area and constituted its permanent population. Again,

many of the agricultural families of the aforesaid districts, who had originally little or no idea of permanently settling here but who programmed to leave for their native districts after the harvesting season was over, with whatever savings they could have from year to year, ultimately took a fancy for the land of the Royal Bengal Tigers, took to cultivation, built houses for themselves and settled down there on a permanent basis. Such a story of migration into the Sundarbans area has already been told in chapter I. The migrants and the local people of the neighbouring villages supplied the nucleus of the furture population of the Sundarbans.

The society that eventually emerged came, under the force of circumstances, to be founded upon Hindu-Muslim unity and upon a blend of Hindu and Muslim cultures. The position was this. In the North 24-Parganas, Vaidic Brahmin Society developed,centering, around the Vaidic Brahmins of Bhatpara. Alongside, another Society, called the Rariya Brahman Society, reared its head, and together influenced the culture of the entire area from Bhatpara to Barisha and Behala on the one side and to Harinavi on the other. But the northern culture had no access to the South 24-Parganas where the predominance of Muslim religion and Muslim culture had been established since the preaching of Muslim religion in the Sundarbans (Vide Lok Sanskriti and Lokotsav of the 24-Parganas by Dr. Ashutosh Bhattacharjee, published in Paschim Banger Puja Parvan O Mela, edited by Asoke Mitra.)[7] There are many evidences of the worship of the same local gods and goddesses and the observance of the same rituals by the Hindus and Muslims in the Sundarban Society. Out of common fear from Nature and ferocious animals the Hindus and Muslims of the Sundarbans have been used to worship Banbibi, Dakshin Rai, Baba Thakur, Gorachand Pir, Bara Khan Gazi, Panchanan Pir, Kalu Rai, Sha Junguli, Manasa, Sitala, Olabibi, etc. irrespective of their religious belief. [8] Before entering the forest area either for fishing or wood-cutting or for the collection of honey and wax, the people of either religious faith reverentially take the name of Pir-Gazi as an amulet against any danger or calamity.

What is noteworthy is that such gods and goddesses are worshipped by lower-class people generally under trees or by the river-side, in fact, in open space. There is no reference to them in the Shastras or in the Puranas. Such local gods were perhaps cre-

ated by the lower class people by their own imagination to help them out of troubles. Upper-class people are not moved by such local faiths. Banbibi of the Muslims is the same as Vishalakshmi or Vana-Lakshmi of the Hindus, Obviously, the deity is worshipped by wood-cutters, honey-collectors, and fish-catchers of both the communities. Banbibi, as the name suggests, is a deity of the jungle. Banbibi is represented as wearing a skirt, a trouser, a crown on head, a garland of wild flowers, necklace, shoes and stockings on legs and having a child on the lap. The carrier and follower of Banbibi is either a hen or a tiger and is believed to have once saved a poor widow's son named, Dukhe Saha, from the clutches of a tiger and thereafter came to be looked upon as the saviour of the poor people. Banbibi is a deity widely adored by the people of the lower strata of society. She is worshipped before entering the forest. (Vide Ratnangsu Bargi, 'Sandarbans' in 'Desh Parichaya Granthamala', July 1984).

Another deity widely worshipped by both the Hindus and Muslims in the Sundarbans area is Dakshin Ray or Lord of the South 24-Parganas, considered as the chief deity of the region. The Dakshin Ray cult constitutes a vital chapter in the socio-cultural history of the region. Dr. Tushar Chattopadhyaya has made a special study of the cult of Dakshin Ray under the caption 'Dakshin Ray, a popular folk god of 24-Parganas'. [9] (Vide 1961 census, vol. II district Handbook of 24-Parganas, Appendix - III). According to his findings, though the worship of the deity prevails in many parts of the districts of Howrah, Hugli, Khulna, Jessore, Noakhali, its chief centre of origin is possibly in the 24-Parganas.

Two idols of Dakshin Ray are found to be worshipped in the South 24-Parganas – (1) the idol of a warrior, armed with sword, gun, bow and arrow, seated on a tiger or horse or standing straight on the ground; (2) a trunkless human head with a leaf-like decorated head-dress. Dakshin Ray is worshipped mostly in the form of a trunkless human head. In this form, the deity is known as Bara Thakur.Dakshin Ray is adored by both the high-caste people and the people of the lower strata of society. While the upper-class people worship the full image of the deity inside a temple daily or bi-weekly, the lower class prefer to worship the deity's trunkless head in open space annually on Paus Sankranti day or the last day of the month of December– January. 'During the occasion, in the 24-Parganas,

especially in all places of eastern and southern areas. Dakshin Ray is worshipped in the image of Bara head in twos' on the ground adjacent to houses, near the ponds, rivers, canals, in the bushes, at the base of trees or on the branches, on the out-skirts of paddy-field or on the paddy-fields. In some places, many Bara heads are placed in a row side by side on a raised altar in the open air on the border of fields or of the village. Though in advanced areas the full human image of Dakshin Ray is worshipped, according to the Shastras, by the high-caste Brahman priests, the fishermen, boatmen, the honey-collectors, the wood-cutters, and the common peasantry basically adore Dakshin Ray Bara head in twos, with traditional folk-rites and customs, without the help of the Shastras or Brahman priests.' (Chattopadhyay, Ibid.)

One folk-rite associated with the so-called worship of Dakshin Ray is known as 'Zatal'. This is how zatal is observed :'Zatal ceremony is observed in the wood at night. Inside the wood or on the field, a particular spot is selected and cleaned and an altar is raised. The altar is enclosed by the branches of a date-palm. Generally, two idols of Bara heads (one male and one female) are placed on the altar. The ceremony is presided over by the priests of lower-caste Hindus. At the time of the worship, torches are lighted, drums are beaten, 'Ganja', wine, and meat are offered. In the ceremonial sacrifice many birds, beasts are offered so that their blood overflows the sacred place. Marking their foreheads with the blood, the drunken devotees, with torches in hand, dance and make obscene gestures and utterances. There are stunning sounds made and pealing music produced. In Zatal rites, drinking, obscene uttrances, licentiousness, animal sacrifies, stunning shouts etc. are essential observances. Ceremonies differ from area to area.' (Chattopadhyaya, Ibid.)

Though traditionally worshipped as a god who protects the people against tigers, Dakshin Ray is usually worshipped as a rain-god, a protector of crops from insects, 'Bastu Devata' or as Kshetrapal. The cult of Dakshin Ray has also some close relation with the cult of primitive fertility, human sacrifice or head-hunting. The trunkless human head seems to indicate the remote past of human sacrifice. And yet Dakshin Ray is being worshipped mainly as a tiger-god in the rural society of the Sundarbans. The popularity of Dakshin Ray as a tiger-god is largely due to the publicity of venera-

tion ascribed to the deity in the Raimangal Kavya, written by Krishnarama Das who was born in the 17th century AD in the village of Nimta in the 24-Parganas. It is significant to note that 'the peculiar terra-cotta trunkless head, discovered along with some bones and stone weapons, similar to the relics of the Neolithic Age, in the village of Harinarayanpur in Diamond Harbour Subdivision, resembles the Bara head.'

There is a controversy over whether Dakshin Ray and Bara Thakur represent one and the same deity or whether they stand for two different gods in popular imagination. According to Muslim tradition, Dakshin Ray was originally the General of Mukut Ray, King of Brahmannagar. His father was Prabhakar Ray. He once held a great sway over a considerable part of the Sundarbans. Pir Bara Khan Ghazi looked upon him as his rival and in the course of a conflict with him severed his head with a sword. This trunkless head of Dakshin Ray came to be known as Bara Thakur, worshipped as a deity. Such a belief is in favour of identifying Dakshin Ray and Bara Thakur as one and the same deity. But it is not binding upon all the devotees. Those who consider them as separate deities argue that while Dakshin Ray is worshipped at night, Bara Thakur, during daytime. Again, Bara Thakur is a combination of two images (Jugal Murti), one of god and another of goddess, placed side by side, whereas Dakshin Ray is single, without a companion, not to speak of a female associate. (Vide Asoke Chattopadhyaya's 'Adim Devata Bara Thakur' in Som Prakash — 2nd Year, No. 4, 1365 B.S.). In fact, Dakshin Ray and Bara Thakur are viewed differently by different exponents of ancient religious beliefs in the Sundarbans.

Like Banbibi, Dakshin Ray, adored by both the Hindus and Muslims of the Sundarbans, so was Pir Bara Khan Ghazi of Ghutiari Shariff, as cited above. Gazi Saheb was reputed as a tiger-tamer. He used to wander about on the back of a tiger. He was adept in the art of causing miracles. Both the communities had great respects for Bara Ghazi Khan because of his power of displaying miracles and his powers to tame such a ferocious animal like tiger

Every year his devotees, both Hindus and Muslims, celebrate his advent from the Ambubachi lunar day for a week in the month of Asar and also observe his 'passing away ceremony' on the 17th day of the month of Sravana. Gorachand Pir, whose real name was Hazrat Shah Saiyad Abbas Ali, was another Muslim leader under

whose banner gathered devotees irrespective of religious faith and offered their respects to him. He was a great spiritual force and held sway over Haroa-Hasnabad area. The Pir's 'Uras' is observed with pomp and eclat at his mosque at Haroa each year for 3 days from the 11th day of the month of Falgun. Thousands of pilgrims, Hindus and Muslims from different parts of West Bengal, even from other areas of India, used to flock together to participate in the festival which is claimed to be more than six-year old.

Social festivals and fairs

In the social life of the Sundarbans people, particularly those of the lower strata of the society, festivals and fairs occupy a special position. People from the lower-class society who live from hand to mouth eagerly await the arrival of the season of festivals when to relax themselves with homely joys after months of hard toil and economic wants all the year round. It is after the harvesting season that they spend even beyond their means over festivals to satisfy their rural test. Even people of the upper-class society do not lag behind and participate in the festivals to test the freshness of life, no matter however short-lived its impact may be. Below is given a list of festivals and fairs held in different villages under different Police Stations in the Sundarbans. (Reference: Paschim Banger Puja Parvan O Mela, vol. III 24-Parganas, edited by Asoke Mitra). [10]

I – Police Staion – Hasnabad

Village Hasnabad — Two-day long Sitala Puja in Baisaka; five-day long Durga Puja in Aswin; Shyama Puja in Kartik; Basanti Puja in Chaitra, and Charak festivals which start 5 days before Chaitra Sankranti commences. The Muslims meet at a religious conference once a year.

Village Rameswarpur — Durga Puja in Aswin, Rashjatra in Kartik, Doljatra in Falgun, Charak in Chaitra. During Doljatra a fair is held for a period of 3-8 days.

Village Ichhapur — Kali Puja in Kartik; Dol festival of Radha-Krishna in Falgun when a 10-day fair is organized. The village contains temples of Kali and Radha-Krishna. In the fair organized during Dol festival, 800-900 men and women from neighbouring areas congregate to participate in the joyous festival. Many shops

are then opened to sell articles of daily necessity to common people. Provisions for 'Nagar Dola', circus, magic-display, games and plays, and gambling, and dice-playing are also made for the amusement of the people.

II – Police Station – Hingulganj

Village Kanaknagar — Durga Puja, Kali Puja, Charak fair– all over 100-year old. The Pods take an active part in them. The area of Kanaknagar was leased by one Mr. Sandel in 1841 to Taran Sarkar and Jogen Ghosh of Sripur for 99 years. The village is called after the name of Kanak Sarkar, son of Taran Sarkar.

Village Bankra — Durga Puja, Hari Puja in Falgun; Raksha Kali, Sitala, and Charak in Chaitra, Neel festival observed on the eve of Chaitra Sankranti, and Siva Puja and Charak held on the Sankranti day (last day of Chaitra).

In the Bankra village, the month of Chaitra each year witneses a fair held for 3 days on a play-ground covering a four-bigha area in front of a Siva temple. Both the Hindus and Muslims share the joys of the fair.

Hingulganj contains a temple of Radhagovinda-Jiu. On the occasion of Dol festival in Falgun, a fair is held near the temple, the fair lasting for 14 days.

III – Police Station-Sandeshkhali

Village Doknamari — Manasa Puja, Kali Puja, 'Tusu' festival in Paus. During the festival, tribal men and women, drink intoxicants and stage 'jhumur dance' and 'Karam dance' and sing together. During Kali Puja even cows and buffaloes are got drunk before playing with them. Ducks and hens are sacrificed during the festival.

Village Nyazat — Durga Puja, Kali Puja, Sitala Puja and Dol festival are celebrated in the village.

Village Sandeshkhali — Manasa Puja, Sitala Puja, Puja of Makal thakur offered by fishermen, and the worship of Dakshin Ray are held.

Village Hatgachha — Durga Puja, Kali Puja, Doljatra at the temple of Radhagovinda-Jiu, fair connected with Doljatra during Hari Puja are held.

Village Sitaliya — Hari Puja in Baisakh, Durga Puja; Rakshakali Puja in Chaitra; Charak festival.

Village Jayagopalpur — Durga Puja, Kali Puja, Hari Puja, Chark fair.

IV – Police Station – Haroa

Village Haripur— Charak and the fair of Charak.

Village Uchildaha — Ratha festival in Asar, Charak in Chaitra, and the fair connected with Charak, Manasa Puja, Kali Puja, and Sita-ma Puja.

Village Haroa — Naba Barsha Utsab in Baisakh, Manasa Puja in Bhadra, Durga Puja, Kali Puja, Nabanna festival in Agrahayan; Paus Parban in Paus; Saraswati Puja in Magh, Doljatra in Falgun, Neel festival, Charak-Gajan, Uras of Pir Gorachanda, Fair in connection with Muharam.

V – Police Station – Minakhan

Village Malancha — Manasa Puja in Bhadra Sankranti and fair in connection with Manasa Puja.

Village Bamanpukuria — Durga Puja and fair connected therewith; Siva-Puja and fair connected therewith; fair in connection with the passing away of Gorachand Pir.

VI – Police Station – Jaynagar

Village Dosa — Sarbajanin Durgotsav, Kali Puja, Dol Utsav. Besides, Lakshmi Puja, Dol and Rus festival in the houses of individual persons.

Village Gobindapur — Gostha Utsab in Baisakh, Dol festival, Charak, fair in connection with Gosthajatra held each year for 2/3 days beginning with 1st Aswin.

VII – Police Station – Kultali

Village Nalgora — Rus festival in Kartik, Siva-Chaturdasi in Falgun, Charak on Chaitra Sankranti followed next day by Gostha festival. While Siva-Chaturdasi and Charak are observed by all.some individual families participate in Annapurna Puja and Rus festival.

Village Sonatikri — Sivaratri in Falgun, Gajan in Chaitra Sankranti.

VIII – Police Station – Canning

Village Canning — Durga Puja. Brahma Puja in Falgun-Chaitra and 7-12-day long fair in connection with Brahma-Puja.

Village Taldi — Gostha festival in Baisakh. and fair: Durga Puja, Saraswati Puja. Kali Puja in Falgun, and three-day long fair connected therewith; Charak.

Village Ray Baghini — Viswakarma Puja in Bhadra Sankranti and '*A-randhan*', Kali Puja, Banabibi Puja on the last day of Paus, Saraswati Puja, Sivaratri, Charak and fair connected with Charak.

Village Ghutiari Sharif — A week-long fair in connection with the advent of Bara Khan Ghazi.

IX – Police Station – Basanti

Village Umjhara — Naba-Varsha festival on the first day of Baisakh; Durga Puja, Independence Day celebration on 15th August each year since India has become independent.

Village Bharatgarh — Sitala Puja performed ceremoniously by all, and fair organized in connection with the Sitala Puja, Doljatra and fair.

X – Police Station – Mandirbazar

Village Siddheswarpur — Gostha festival, Janmashtami, Kali Puja, Rus festival, Saraswati Puja, Doljatra, Gajan from about the end of Chaitra; Charak on the last day of Chaitra.

Village Vidyadharpur — Pujas are held and offerings made in adoration of Kali, Chandi, Viswakarma, Panchananda, Bara Thakur, Sitala, Manasa, Narayan, Pir.

Village Purva Gopalnagar — Gostha festival, Dharmaraj Puja on the full-moon of Baisakh, performed only by the Paundra-Kshatriyas of the village.

Village Purva Vishnupur —Durga Puja. Lakshmi Puja, Kali Puja, Paus Parvan in Falgun, Doljatra, Birthday celebration of Lord Ramkrishna, Ganga Puja.

XI – Police Station – Kulpi

Village Deria — Fair in connection with Rathajatra in the month of Asar.

Village Shyam Basu's Chak — Dharmaraj Puja, Rathajatra, Saraswati Puja, Charak, fairs, held in connection with both Rathajatra and Charak.

Village Udayarampur — Shiva's Gajan, Charak, and a fair connected with Charak, Panchanan Puja, Sitala Puja, Manasa Puja.

Village Durganagar — Shiva's Gajan, festival running for 5 days from 25th day of the month of Chaitra.

XII – Police Station – Mathurapur

Village Uttar Govindapur — Fair in connection with Gosthajatra.

Village Gilab Chhat — New year's day festival (1st of Baisakh), Durga Puja, Lakshmi Puja, Doljatra, Annapurna Puja, in Chaitra, Sitala Puja, Manasa Puja, Bibima Puja.

XIII – Police Station – Patharpratima

Village Digambarpur — Narayani Puja in Falgun, Rakshakali Puja, Doljatra, Siva Puja, Shiva Chaturdasi day.

Village Kamdevpur — Chandani festival and fair for 3 or 4 days from Akshaya Tritiya.

Village Radhanagar — Fair in connection with the Puja of Vishalakshmi in Falgun.

XIV – Police Station – Kakdwip

Village Sitarampur — Mahotsav (Great festival) in the Harimandir (Temple of Lord Hari), Puja of Vishalakshmi, Puja of Sitala.

Village Manmathapur — Puja of Ateswar Siva, Sitala Puja, Manasa Puja.

Village Mrinalnagar — Annual Puja of Vishalakshmi and festival.

Village Manipur — Ganga Puja and fair for a week from the last day of Paus, Charak, Gajan, Neel Puja, Puja of Vishalakshmi.

XV – Police Station – Namkhana

Village Amaravati — Durga Puja, Makar 'Snan' (Ablutions) and Ganga Puja on the last day of Paus– fair in connection of Makar ablutions, annual worship of Vishalakshmi performed by the people in general.

XVI – Police Station – Sagar

Village Silpara — Sivaratri observance. Charak on the last-day of Chaitra, Sitala Puja, and Manasa Puja.

Village Mrityunjaya nagar — Manasa Puja. Rusjatra in Kartik. Doljatra in Falgun, Sivaratri festival Puja offered to Vishalakshmi.

Village Sumatinagar — Durga Puja, Basanti Puja in Chaitra.

Village Lalpur — Durga Puja, Kali Puja, Rusjatra on the full moon of Kartik, Siva Puja in Chaitra.

Village Baguakhali — Sivaratri in Falgun, Kali Puja, Sitala Puja, Manasa Puja.

Ganga Sagar mela and the worship of Kapil Muni on the Sagar Island are highly entertaining not only to the local people but to the devotees and fair-loving people all over the country.

Obviously, the worship of different gods and goddesses and the fairs organized in connection therewith offer sources of amusement to the Sundarbans people by breaking the monotony of life and by breathing freshness into their wearisome existence. Cinema shows and Jatra performances may offer popular sources of entertainment to the people. In this connection, a glossary of the varieties of worships and celebrations connected therewith, as mentioned above, is offered below :

Charak	—	A festival in honour of god Siva, held on Chaitra Sankranti or on the last day of the of the month of Chaitra.
Gajan	—	Songs sung about god Siva during Charak festival.
Sivaratri or Siva-Chaturdasi	—	This relates to the worship of god Siva on the Chaturdasi or fourteenth tithi or lunar day of the Dark fortnight of the month of Falgun.
Paus Parvan	—	A festival held on the last day of the month of Paus for preparing delicious food with the rice of newly harvested paddy. Such food is offered first to gods and goddesses and then taken by householders.
Doljatra or Jhulan festival or Holi	—	A festival relating to Lord Krishna on the full moon day of Falgun.

Rathajatra	—	Also called car-festival held on the second lunar day of light fortnight of the month of Asar, Lord Jagannath of Puri travels in the car along with other members of His family to the near-by Gundicha house belonging to His mother's sister. Lord Jagannath stays there for seven days and comes back to His residence. This return journey is known as 'Ulto-rath.'
Rus	—	This represents the festival of dance of Lord Krishna and Sri Radha in the company of milkmaids on the light fortnight of Kartik.
Janmasthami	—	This represents the celebration of the day of advent of Lord Krishna, falling due on the 8th day of black fortnight of the month of Bhadra
Gostha festival	—	This is Lord Krishna's divine manifestation on the sprawling ground meant for tending cows on at Vrindaban.
A-randhan	—	This represents the Hindu social custom of not cooking food on the last day of Bhadra. This synchronizes with the Viswakarma Puja. Oviously, the food taken on the day is the previous day's cooked food.
Akshaya Tritiya	—	A very auspicious day synchronizing with the 3rd lunar day of light fortnight of the month of Baisakh. The general belief is that the day marked the advent of Satya Yuga.

Names of month ··· corresponding to English almanac

Baisakh	—	April – May
Jaistha	—	May – June
Asar	—	June – July
Sravan	—	July – August
Bhadra	—	August – September
Aswin	—	September – October
Kartik	—	October – November
Agrahayan	—	November – December

Paus	—	December – January
Magh	—	January – February
Falgun	—	February – March
Chaitra	—	March – April

Material condition of living

A study of the material condition of the people of the Sundarbans offers no bright or optimistic picture. The rural people, the majority being landless agricultural labourers, hardly live above the plimsoll line of poverty. Literacy of the people and higher education among them leave much to be desired. Poor communication and extreme poverty have been the principal causes of the low literacy level in the region. At present, there are 185 high schools. 125 junior high schools, 162 upper primary schools, 29 madrashas and 1629 primary schools. Under-graduate colleges are located at Patharkhal. Tangrakhali, Dakshin Barasat, Basirhat, Diamond Harbour, Bireswarpur and Champahati. There is 33·39 per cent literacy, although in Minakhan and Sandeshkhali it is below 20 per cent, and female literacy is below 8 per cent (vide IUCN, op cit., p. 150).

Communication facilities within the Sundarbans are inadequate and undeveloped. It is difficult to gain access to different areas separated by innumerable waterbodies — estuarine rivers, creeks, and khals, especially during the rains. Then many roads go under water, some turn too slippery with mud-coating to walk upon while the length of the metalled road in the Sundarbans as a whole is only 280 km. and that of the railway track is only 42 km. In recent years, 800 km. of brick-soled roads have been constructed but the communication facilities remain poor as before (vide IUCN, p. 148) Efficient communication may be achieved by the introduction of mechanized boat services. (Ibid.) Electric facilities are most inadequate. Only Bakkhali, Fraserganj, Kakdwip, Namkhana, and Sagar Island in the western sector, Jaynagar and Canning in the central Sector, and Hingulganj and Hasnabad in the east have the supply of electricity. Generators have been installed in some places to supply electricity locally. (vide IUCN, op cit., p. 148).

Circumstances force the people to live on the margin of subsistance, with modest clothings and the most ordinary dwellings. The clothings normally consist of Dhuti, Chador, Shirt or Punjabi (an outer garment), and a gamchha (scarf-like) which is a

must in the case of peasants and labourers. The garment is of a coarse quality, though currently the younger generation coming into contact with Calcutta and other urban markets have been used to somewhat fancy goods.

The dwellings are mostly mud-built or to be precise, built of mud, Sundri posts, bamboos, and reed mats. The floor of a house is of mud, its sides are made of reed-mats with split bamboos laid across, which are sometimes painted black. The roof of a house is thatched with straw, son grass (a slender long grass which does not easily rot in the rains), with golpata or with the leaves of the Hental or wild date tree. People who are somewhat economically better placed dwell in better houses which, if not entirely brick-built structures, are constructed, at least partly, with durable materials like brick and cement.

Of furniture, a peasant family has practically nothing. A few planks to sit on or lie upon, some earthen pots and brass utensils perhaps complete the list.

Rice is the principal item of dish – rice of two varieties, autumn Aus and winter Aman. Rice besides, the cultivators grow, for home consumption, vegetables, peas, mustard, til seed, tobacco, chillies, onions, garlic, pumpkin, cucumber, melon, kachu, yam, and plantain. The Sundarbans abound in fishes of diverse varieties which obviously constitute an important menu of food served in all families, high or low.

Cultivators and landless labourers have normal leanings towards living beyond their means, with the result that many, if not all, run into debt. Rai Sahib Anil Lahiri, Deputy Collector, 24-Parganas, in his 'Final Report on the Survey and Settlement Operations in 24-Parganas, 1924-33', wrote on page 26 : 'The economic enquiries conducted during the operations indicate that ordinarily a cultivator is able to maintain himself and his family without running into debt. But majority of the people are not contented unless living a life beyond their means. Western civilization with its attendant advantages and disadvantages, the expansion of industrial concerns. and the facility for easy communication throughout the district have opened the eyes of the ease-loving and erstwhile peace-loving husbandmen and increased their wants. Agriculturists. therefore. must and will borrow. The necessity is due to the fact that his capital is locked up in his land and stock which cannot be converted to

cash without reducing his income and means livelihood. The final result is that the majority are heavily in debt.'

Tradition dies hard. The propensity to borrow persists.

Notes

1. Browning — The Melon-seller.
2. Sundarban Development Board — Administrative Report 1981-82 to 1991-92.
3. Vide Sujit Sur, Sundarbaner Katha in Bartikas, Octo.– Dec. 1982, pp. 22-23.
4. Paschim Banger Puja Parvan O Mela, ed. by Asoke Mitra.
5. Census of 1961 – District Handbook, 24-Parganas, vol.II.
6. Primary Census abstract, 1991.
7. Dr. Asutosh Bhattacharjee – Lok Sanskriti and Lokotsav.
8. Role of Social Forestry in the developments of the Sundarbans, published by Social Forestry Division.
9. Dr. Tushar Chattopadhyaya, Dakshin Ray.
10. See FN 4. Ibid.

CHAPTER-VI

Mangrove Forest and Forest-dwellers — Royal Bengal Tigers and others.

Mangrove Forest

An absorbingly attractive image of the Sundarbans is the vast stretch of Mangrove forests occupying the mouth of the Ganga-Brahmaputra River-system of the estuarine lower Bengal bordering on the Bay. In fact, the Sundarbans and the Mangrove forests are co-terminus. The Mangrove and Mangrove Associates constitute the woof and warp of the structure of the Sundarbans. When the Colonial Government undertook the reclamation of the forest area of lower Bengal in the second half of the 19th century, it found the area inhospitable and inaccessible due to the wild luxuriant growth of Mangroves and Mangrove Associates, and Mangrove grass. The forest area was in reality the Mangrove area and the existing forest, much reduced in area though, is still famous under the same name. Those concerned with ecology and eco-system – catchy words these days – are enamoured with the study of the Mangrove and Mangrove Associates. Looking like a vast stretch of green carpet in aerial surveys, the Mangrove forests consist of dense, low trees, predominantly of Excoecroria agallocha and Ceriops decandra species. Excoecroria agallocha is particularly dominant close to the sea and Ceriops decandra is found largely as a degenerate form. Both the species are increasing in number and are replacing other species. (IUCN, 39 op cit.).

The Sundarbans delta is the world's largest Mangrove forest-belt, the jurisdiction of which in the Indian sub-continent extends mainly to three areas — 24-Parganas, Bakarganj, and Jessore-Khulna. The partition of India saw the largest chunk of the Mangrove-belt allotted to the then East Pakistan (now Bangladesh). [1] The geographical area of the Mangrove forest has strunk from 9630 sq km (original forest area below the Dampier-Hodges Line) to the present Mangrove area of 4,264 sq km. Recently the F.S.I. (Forest Service of India) has estimated that the actual Mangrove

vegetation–cover should be 2,119 sq km, the balance being either water-bodies or blanks of saline patch or mud-flat or chars. The position is this : out of the total land-area of 87, 617 sq km of West Bengal, the forest cover is 11,970 sq km and the mangrove occupies 4,264 sq km, exclusively restricted to the 24-Parganas deltaic region. (vide A. K. Mandal and N. C. Nandi — Fauna of the Sundarbans Mangrove Eco-system, West Bengal). The area of 4,264 sq km has been further reduced to 2,119 sq km, according to the estimate of F.S.I., as stated above.

How could Mangrove be defined ? Mangroves, derived from the Portuguese word, Mangue, and the English word, grove, are salt-loving or salt-tolerant halophytic plants, growing in tidal swampy regions. The variable salinity and P. H. sanday or loamy soil with different grades of subsurface nutrient, weather hazard etc. of the area support a specialized group of plants known as Mangrove. Such plants growing in association with some other plants within the same eco-system are collectively known as Halophyte. F. Blasco et al. (1975) have defined the mangrove 'as a type of coastal woody vegetation that fringes muddy saline shores and estuaries in tropical and sub-tropical regions.' (2) Based on the above definition, Blasco et al. tabulated the Indian mangroves as follows : (3)

Total area under Indian mangroves, 1975

States	Location	Area under Mangrove in sq km
West Bengal	Gangetic Delta	2,000
Andaman & Nicobar Islands	Bay of Bengal	1,000
Maharashtra	Arabian sea	200
Gujarat	Saurashtra And Cutch Coast	200
Andhra Pradesh	Godavari & Krishna Estuaries	100
Orissa	Dhamra & Mahanadi Estuaries	50
Madras	Cuvery delta	15
		3, 565

The table establishes that though mangrove is cultivated in different parts of India, the mangrove area in West Bengal, that is, in the Sundarbans (24-Pargans), is the largest in extent.

Indeed, mangroves constitute 'a very specialized forest eco-system found at the land-sea interface of the tropical and sub-tropical regions of the world bordering on the sheltered sea-coasts and estuaries. These forest-systems are dominated by the salt-tolerant halophytic seed-plants that range in size from tall trees to shrubs and, being restricted to the inter-tidal belts, are exposed to high and low tides twice in 24 hours. This very vibrating eco-system supports numerous terrestrial, benthic, and aquatic organisims.'

It follows then that mangroves grow in swampy, low-lying coastal areas, adjacent to saline water-bodies, inundated frequently by tidal water. Mangrove soil is fine, clayey, often semi-fluid or ill-consolidated. Soil layers are formed by the sedimentation of tidal saline, brackish water. Fond of saline water though, mangrove is also athirst for fresh-water. On the basis of field-survey conducted in the past on the vegetation structure of mangrove formation and plant by S. G. Curtis, V. G. Chapmann, Seth, and F. Blasco, it was held that mangrove depended upon seven basic requirements: [4] air temperature, ocean currents, protection, shallow shores, salt water, tidal range, and a mud substrate. 'World's largest macro-tidal delta (the Sundarbans) with high tidal ranges, strong tidal currents, protected and sheltered estuaries, wide shallow off-shore zone, suitable air-temperature, incoming salt water to the upper reaches, and the thickest mud substrate of deltaic deposition creates an ideal environment for the natural growth of mangrove vegetation.'

Mangrove forests have a global extent. They have grown in different parts of the world. Though the tropical coastal areas of America and Africa have small patches of mangrove forests, significantly larger areas are found in Indonnesia, Malayasia, Philippines, Thailand, Bangladesh and India. The largest chunks of Mangrove forests occur in Bangladesh and India.[5] So far as India is concerned, mangrove forests have flourished in West Bengal, the Andaman and Nicobar islands, Maharashtra, Gujarat, Andhra Pradesh, Orissa, and Madras. Of the mangrove forests in these Indian states, those in West Bengal or 24-Parganas top the list in extent. According to Professor Amalesh Chaudhury of Marine

Science Department of Calcutta University, mangrove species on a global basis varies from 60 to 64. In the Indian portion of the Sundarbans, the number of species is 34. The height of the Sundarbans mangrove varies from 20′-25′ to 40′ - 45′. According to S. K. Das, I. F. S., the Sundarban forests contain 35 true mangroves, 28 associates, and 7 obligatory mangrove species. Among them 30 are trees, 20 shrubs and 20 herbaceous flora. A list of mangrove plants (Tree, Shrub, Climber, Herb, and Grass) is presented below from Project Document No. 10 of the Sundarbans Biosphere Reserve, by way of illustration :

A LIST OF PLANTS IN THE SUNDARBANS BIOSPHERE RESERVE

Sl. No. Scientific Names	*Local Names*
1. Acanthus ilicifolius L.	L. Harguza (S)
2. A.volubilis Wall	Lata Harguza (C)
3. Aegialitis rotundifolia Roxb.	Tora (S)
4. Aegiceras carniculatum (L) Blanco	Khalsi (T)
5. Avicennia alba Blume	Piara Baen (T)
6. A. marina(Forsk) Vierh.	Kala Baen (T)
7. A. officinalis L.	Jat Bean (T)
8. Aglaie cuculata (Roxb) Pellegrin	Amur (T)
9. Acrostichum aureum L.	Hodo (S)
10. Brugruiera cylindrical (L) Blume	Bakul (T)
11. B. Gymnorhiza (L) Lam.	Kankra (T)
12. B. Sexangula (Lour) Poirot	Kankra (T)
13. B. Parviflora (Roxb.) Wight and Arn.	Bakul (T)
14. Brownlowia tersa (L) Koster	Lata-Sundari (S)
15. Cerbera manghas Geartn.	Dakor (T)
16. Clerodendrum inerme (L) Geartn.	Banjai (S)
17. Caesalpinia bunducella (L) Roxb.	Nate (S)
18. C. cristata (L)	- Do- (S)
19. Ceriops decandra (Gritt) Ding Hou.	Jhamti or Jele Goran (S)

Sl. No. Scientific Names	*Local Names*
20. C. Tagal (Perrottet) C. S. Robinson.	Math Goran (T)
21. Cynometra iripa kostel	Singra (T)
22. Derris scandens (Roxb.) Benth	Kalilata (C)
23. D. heterophylla (Willd) Back and Bakh.	Kalilata (C)
24. Dalbergia spinosa Roxb.	— (C)
25. Entada scandens Benth	Gila (C)
26. Excoecaria agollocha L.	Genwa (T)
27. Finlaysonia obovata L.	Dudhilata (C)
28. Fimbristylis ferruginea	— (H)
29. Hemithrea compressus L.	— (Gr)
30. Heliotropium curassavieum Linn.	— (H)
31. Heritiera fomes Buch-Ham.	Sundari (T)
32. Hibiscus tilliaceous L.	Bhola (T)
33. Kandelia candel (L)Druce.	Garia (T)
34. Lumnitzera racemosaWilld.	Kripe (T)
35. Mukuna gigancea (Willd)D.C.	— (C)
36. Myriostachya wightiana (Nessex Steud) Hook I.	Ghash (Gr)
37. Nypa fruiticans Wurmb.	Golpata (T)
38. Phoenix paludosa Roxb.	Hental (T)
39. Porterasia coarctata (Roxb.) Tateoca.	Dhanighash(Gr)
40. Pandanus tectorius Soland	Keya (T)
41. Pluchea indica Linn.	—
42. Rhizophora apiculata Blume.	Garjan (I)
43. R. mucronata Lam.	–Do– (T)
44. Sacharum cylindricum L.	Ulu (Gr)
45. Suaeda nudiflora Mog.	Gira sak (H)
46. S. monoeca L.	Nonaguru (H)
47. S. meritima Dumort.	Nonaguri (H)
48. Sesuvium portulicastrum L.	Jadu Palang (H)
49. Salicornea brachiata Roxb.	— (H)
50. Salacia prinoides (Wild) D.C.	—
51. Scirpus littorea Schrad.	— (H)

Sl. No. Scientific Names	*Local Names*
52. Sonneratia apetalaBuch-Han	Kaera (T)
53. S.caseolaris (L) Engl.	Ora (T)
54. S.griffithii kurz.	Ora (T)
55. S.alba J. Smith	Ora (T)
56. Stenochlaena palustre Bold.	—
57. Stichtocardia tilifolia Hallier F.	— (C)
58. Thespesia populnoides (Roxb.) Kostel.	Paras (T)
59. T.populnea (Linn.) Solex Carrea	-Do- (T)
60. Tamarix troupii Hole	Nona Jhau (T)
61. T. dioica Roxb.	- Do-
62. Viscum orientale van.	— (C)
63. Xylocarpus granatum Koenig.	Dhundul (T)
64. X. mekongensis Pierre. (Syn. X. gangeticus Parkinson)	Passur (T)

Key words

T = Tree S = Shrub
C = Climber H = Herb Gr = Grass

Nature and Characteristics of mangroves

Mangrove forests maintain their separate identity and are different in nature and characteristics from other types of forests which are not so gregarious as the mangrove forest trees are. The mangrove forest trees, as noticed earlier, are specially adapted to survive on a tidal swampy area, mostly covered with mud, permanently wet with salt or brackish-water, and submerged during high tides. They grow thick but rarely develop on the open sea-face and never on the sandy banks.[6] In this tropical hot humid climate, the river-borne fresh-water silt, mixed with saline and brackish-water estuarine debris, forms a complex environment of air, water, soil, which linked with the flora and the fauna, create the Mangrove Eco-system. The man-grove forests should better be called Mangrove Eco-system.[6A] Here man lives in close touch and harmony with Nature. Here men and animals live together in co-existence, not, of course, in co-operation. Each year, according to one estimate, 5,000 fishermen,

500 honey-collectors and 500 wood-cutters enter deep into the forests to earn their bread, knowing fully well the nature of the terrain and the possibility of deadly attack of man-eating tigers, crocodiles, etc. from behind. The terrain is, indeed, hostile, the ground inhospitable, and the forests, almost impenetrable. 'The forest area with its tidal rivers and wide stretch of low dense forest is unique in its density and bio-diversity. The razor-sharp innumerable pneumataphores pointed upwards dangerously, with thick undergrowth of Hental, have made the forest hazardous, risky and dangerous.' (S. K. Das, I. F. S.). Moreover, the whole area is prone to storms and cyclones during the monsoon despite embankments which have been constructed for the protection of inland area.

Henricks Hodge in his article entitled 'The trees that walk to the sea' (published in Nature Magazine, vol. 49, No.1, 1956, pages 456-460) refers to the mangroves as 'the most unusual among trees that regularly walk to the sea.' Each mangrove tree is surrounded by a mass of rope-like prop-roots which grow down from the main trunk and lower branches, tying them firmly to the soil. Such rope-like prop-roots also often dangle from the upper branches, eventually penetrating this tidal mud or marl below. In this position, the tree seems to be walking into the sea. Again these roots, submerged regularly by the tides, become encrusted with oysters. This has given rise to 'the unusual but true tale of plucking oysters from trees.' Though mangroves have the unique habit of thriving with their roots submerged in salt water, they are also 'thirsty' for fresh water which they require for their sustenance. The prop-roots enable the trees to be anchored firmly on the unstable, shifting mud of tidal areas. They are also respiratory in nature, acting 'as a sort of living air-hose, permitting gaseous interexchange to the underwater parts of the roots.' (vide Hodge. Ibid.)

Again, there are plants which drop seeds into water, producing seedlings in the process. Plants whose offsprings are thus produced as germinating seedlings are termed viviparous. Mangroves are good examples of such plants.'A single tree may produce 300 viviparous seedlings during a single season.' (Hodge, Ibid.)

Most of the mangrove species are ever-green trees, occasionally shrubby. They grow gregariously as deep thickets, without leaving any open space on the soil-floor or forest-bed. Even sunlight cannot penetrate into the interior. The tidal flows which wash the floor

regularly sustain the growth of the herbaceous species. (Naskar and Guha Bakshi, 61 op cit). The flora and fauna constitute integral parts of the Mangrove Eco-system.

Usefulness of mangroves

The Mangrove forest area of the lower South Bengal was subjected to adverse criticism by the colonial government before reclamation when it was branded as a stinking, impenetrable, mosquito-infested, dirty, and inaccessible region. Ultimately, however, government decided on its wanton reclamation for human settlement, cultivation and also for State revenue. With the progress of reclamation the Mangrove forests were found to be useful both to men and animals in many different respects.

The Sundarbans constitute an ideal habitat of the fauna of the region. The mangrove Eco-system supports a wide assemblage of animal communities. Some animals are the permanent dwellers of the mangrove forests, some are merely casual visitors, visiting the zone for food and for breading, but living elsewhere. Still others use the mangrove habitat for shelter or roosting. Tigers and crocodiles are the two major consumers of the mangrove Eco-system, birds, snakes etc. being the minor ones.

The estuaries of the Sundarbans offer ideal spawning areas for many varieties of sea-fish: Mangrove swamps are important nursery grounds for the young ones of the commercially important fishes like shrimps, prawns and the like. Indeed, brackish-water fish-culture depends much on mangrove Eco-system. As many as about 133 species of fish have been identified as supported by mangrove Eco-system. Fishes swim to the mangrove estuaries for their food. Fruits that fall from the trees and other organic matter, sunk in deep water, get decomposed and form the food for the fishes—phytoplanktons, zooplanktons. Experts believe that the excreta of crocodiles provides a considerable amount of nutrients for the aquatic animals. Coastal fishing depends on the mangroves to a large extent.

Again, mudflats are the magnificent home of the mangrove flora and fauna, Mudflats are specially vegetated by mangroves which protect them by their intricate root-system.

Mangrove Eco-system is also economically significant and commercially important for the various mangrove forest products

ranging from firewood, timber, construction-materials to the reptile skins, crocodile skins, honey, wax, alcohal, dyes of textile, leather-colouring, and fisheries. Mangrove trees contain high calorific values for which the Mangrove wood is so valuable for fuel and charcoal-making purposes. Wood is mostly heavy and, therefore burnt for high calorific return. Mangroves stabilize coastal shore-line, arrest bank-erosion and help to form new islands in the Sundarbans. The current coastal erosion in the south-western part of the Sundarbans, it is said, is due mostly to the felling of mangroves on the shores. The vulnerability of the coast to the erosive forces will be much reduced as also the possibilities of the outbreak of storms and cyclones considerably minimized, if due care be taken for the plantation, development, and maintenance of mangrove trees. Mangroves are, in fact, most effective in protecting the land-mass from tidal surges, cyclonic storms and high winds. Mangrove forests provide nutritional inputs to the adjacent shallow channels and bays that constitute the primary habitat of a large number of aquatic species of commercial importance like fish and shell fishes. 'Both-types of fishery, in-shore and off-shore, are ultimately dependent on a common resource sustained by the estuarine mangrove Eco-system which, including large areas of back-waters and lagoons, is recognized as world's most potential nursery.' Again, pneumatophore roots of mangroves are usable for corks, hogla (Nyra) for thatching material, young Nyra leaves for cigarette paper substitute. Indeed, mangrove Eco-system, if properly managed, can satisfy our multiple resource-needs on a sustainable basis. Indeed, mangroves are a highly valued system in terms of ecology, economy, and environment.

Relevant to the usefulness of Mangroves, the following other aspects may be mentioned here. Mangrove trees are a rich source of tannin. Ceriops decandra is the main source of tannin in the Sundarbans. Wood-cutters collect the Tannin trees with permits and bring them to Calcutta where the bark is strippedoff and sold to the local tanneries where the mangrove bark or extract in tannin is much in demand. The tannin is reddish in colour and other tanning materials are often mixed with it. The mangrove tanning is regarded as the cheapest form of tannin. It is also used for the manufacture of plywood and the joining of wood. (IUCN, p. 175 op cit).

Tannin content in some mangrove plants is shown below in a tabular form. (IUCN, 176, Ibid). Also are presented below in tabular forms the 'Medicinal uses of the mangroves and the traditional uses of mangrove species.(Ibid , p 178 and p. 175)

Tannin content in some mangrove plants

Species	Tannin percentage
Aegialites rotundifolia	12·2
Aegiceras corniculatum	7·0
Amoora cucullata	8·0
Bruguiera cylindrica	17·8
B. gymnorhiza	36·0
B. parviflora	25·4
Ceriops decandra	29·0
C. tagal	29·0
Excoecaria agallocha	12·0
Heritiera fomes	11·0
Lumnitzera racemosa	19·2
Kandelia kandel	15·2
Rhizophora apiculata	33·0
R. mucronata	20·0
Sonneratia apetala	10·2
S. griffithii	8·4
Xylocarpus granatum	25·0
X. mekongensis	24·0

Medicinal uses of Mangroves species

Species	Medicinal uses
Acanthus sp	The crushed fruit makes a good blood purifier and dressing for boils and snake bite. The seeds have anthelmintic properties. Useful in asthma and dyspepsia.
Ammania baccifera	Entire plant used as purgative.
Avicennia sp.	Seeds made into paste to relieve small pox ulceration. Resinous exude used for birth control purposes.
Bruguiera eriopelata	Lotion from fruit used for eye. Fruit is chewed as betel nut. Young radical used as vegetable.
Caesalpinia nuga	Roots diuretic. used in the treatment of stone.
Cerbera odollum	Bark and nuts as purgative and narcotic.
Cerbera sp.	Fruit when rubbed give relief from pain of rheumatism. The sap has purgative property. Sap when externally applied always relieves the poisonous effects of fish stings.
Ceriops sp.	Obstetric and haemorrhage cases are treated with an infusion of Ceriops bark. Seeds yield. edible oil and fat. but not commercially used.
Ceriops tagal	Roots used as substitute for quinine.
Derris indica	Seed powder used for bronchitis and whooping cough.
Derris sp.	Stems and root contain poisonous chemical to kill fish.
D. triplicata	Entire plant used as antispasmodic and stimulant.
Excoecaria sp.	Hard wood and pneumatophores give scent. but not commercially used.
Hibiscus tiliaceous	Decoction from leaves useful as hair restorers expectorants. and for treatment of obstinate cases of urine. Roots used in preparation of embrocations.
Ipomoea pes-carpas	Leaves used for rheumatism and as astringent.
Kandelia sp.	Bark forms an ingredient in a mixture given for diabetes.
Lumnitzera sp.	Decoction relieves thirst in infants. Stem decoction used against itches.
Rhizophora sp.	An infusion of the bark of R mucronata is given for haematuria. Stilt roots some times used as anchor. Root decoction used in blood pressure.
Sonneratia sp.	Fruit made into poultices for sprain and the fermented juice is used to check haemorrhage. Fruits are edible.
T. quallica	Galls and twigs used as astringent and for dysentery.
Tamarix dioica	Bark used as tonic and for skin diseases.
Thespesia iampus	Roots and fruits used for gonorrhoea and syphilis.
Thespesia sp.	An ointment made from seeds kills lice. The leaves furnish a specific active principle for relieving headache.
Trianthema portulacastrum	Entire plant for heart disease and anaemia.
Xylocarpus mekongensis	Bark used for dysentery diarrhoea as febrifuge.

Traditional uses of mangrove species

Aegiceras corniculatum	Bark used as fish poison. Also contains tannin.
Avicennia alba	Used for fodder and fuel.
A. officinalis	Used for firewood. Bark contains tannin.
Bruguiera caryophylloides	Wood used for firewood and timber. Bark used as tannin.
Bruguiera gymnorhiza	Wood used for house posts. Excellent fuel. Bark contains tannin.
B. parviflora	Timber used as fuel. Leaves and bark contain tannin.
B. sexangula	Timber used in house building.
Ceriops tagal	Used for keels of boats and house posts. Provides good fuel charcoal. Bark is rich in tannin used for dyeing fishing nets.
Rhizophora muconata	Bark is used for tannin and cattle fodder.
Sonneratia acidia	Excellent fuel. Pneumatophores used as substitute for cork.
S. apetala	Wood used in house building, packing cases, and yields excellent fuel.
Xylocarpus granatum	Yields gum, resin which is used in local medicine. Bark contains tannin.

The forest-dwellers

The mangrove forest offers an ideal home to the varieties of fauna, a wide assemblage of animal community. It is in the interests of ecologists, naturalists, social scientists, zoologists, tourists, local people, and the Revenue Department that the Government of West Bengal has been taking a new look at the mangrove eco-system and at the forest-dwellers towards ensuring their comfortable habitat with all the amenities required for their undisturbed living there.

Towards this end, specifying the forest areas for the different types of fauna was considered as the first and primary item on the agenda of the Government Department concerned, as detailed below: (7)

The gross total mangrove forest area measures 4,264 sq km out of which 2,585 sq km represent the Sundarbans Tiger Reserve (S. T. R.) and 1,679 sq km are under the 24-Parganas Division. Again, out of 2,585 sq km, 1330 sq km represent the core area of S.T. R. or National Park meant exclusively for tigers, 362 sq km,

Sajnekhali Sanctuary for birds only and 893 sq km, Buffer forest area.

Again, out of 1,679 sq km, 38 sq km represent Lothian Sanctuary for bees, pigs and deer, 6 sq km, Halliday Sanctuary for birds, pigs and deer, and 1,635 sq km, for other forest area.

Within such areas, different types of the Sundarbans fauna are meant to live and flourish in a spirit of co-existence. Among the forest-dwellers the pride of place is given to the tiger, popularly nicknamed the Royal Bengal Tiger. [8]

The tiger population has to be preserved, to be saved from extinction. With this end in view Project Tiger was launched within the Sundarban Tiger Reserve of 2,585 sq km, as cited above. Within the S.T.R., an area of 1330 sq km has been earmarked for the purpose as the core area or National Park which is meant exclusively for the movement of tigers and their dwellings. It was thanks to the 'World Wild Life Fund' that 9 tiger Projects initially came into existence in 9 States of India of which the Sundarbans constituted the one, with effect from 1st April 1973. The Sundarban National Park is bounded on the east by the Harinbhanga river, by the Bay of Bengal on the south, the river Matla on the west, and the forest blocks of Netidhopani, Chamta, Chandkhali and Bagmara on the north. The objectives of the Project Tiger are not only to protect the tiger population but also 'to conserve its natural habitat with a view to maintaining natural balance in a particular eco-system.' The above objectives apart, the Tiger Project has its own utilities to the people of the Sundarbans. It is well known that the Sundarbans tigers have earned the notoriety of being man-eaters for a long time past, which led the local people to demand the extinction of the tiger population of the Sundarbans. But the Project has segregated the tigers in an area, well protected, self-sufficent in animal prey, and far away from human habitats so as to restrict the area of their movement and to bring about a change in their behaviour and attitude towards men. The segregation of tigers is likely to assuage the fears of the local people and help in establishing a correct understanding between tiger and man and in reducing the areas of conflict between them. Moreover, the development of the Project offers economic prospects to the people of the area, with increased avenues of employment and trade in view of the expected increase in the flow of tourist traffic.

Are all the tigers of the Sundarbans man-eaters ? According to A. B. Chaudhury and Kalyan Chakravorti, all tigers of the Sundarbans are not so. They think that only 25 per cent of the tigers are 'inherent or designed' man-eaters. (vide the authors' Sundarban mangrove, Ecology and Wild life, page 4.) M.K. Chaudhury and P. Sanyal also hold the same view: It is not known whether all the tigers in the Sundarbans are man-eaters.[9]

How to account for the Sundarban tigers turning man-eaters, even though their percentage be small ? In the opinion of Dr. Kalyan Chakravorti who has made an in-depth and critical study of the man-eating nature of the Sundarban tigers in his 'Manush O Bagh' (Man and Tiger, pages 14 and 16) the major causes of the Sundarban tigers turning man-eaters are the easy availability of human prey, want of the varieties of prey-animals, and the use of saline water of estuarine rivers, and creeks as drinkable water, which could probably have brought some change in the liver and urethra inducing man-eating propensity of the tiger.

M. K. Chaudhury and P. Sanyal emphasize such causes as (a) disturbances caused by permit-holders to the tigers' habitat, (b) salinity of creek-waters, (c) prey-predatory gap. [10]As regards (a),four types of permit-holders disturb the tigers by entering their habitat — (1) fishermen who mostly frequent the small creeks and side creeks deep inside the habitat; (2) coupe permit-holders who usually operate in large bodies in fixed areas twice a year during the rainy season and winter; (3) honey-collectors who operate deep into the tigers'habitat during April and May; and (4) permit-holders collecting leaves of Hental and Golpata.

These permit-holders have of necessity to travel deep inside the forests in search of a particular produce as the species are found scattered throughout the habitat. It is quite likely that the disturbances thus caused to the tiger's den and the easy availability of human prey might have influenced the tiger's mind in selecting human beings as his natural prey. Again, honey-collectors enter the forest in search of beehive in April-May, and in the course of their search disturb a tigress with her cubs. In such a situation, the tigress kills the honey-collectors in defence of her cubs or of self. The tigress kills by sheer chance, not through design. But with the repetition of the same incident the tigress and her progeny become confirmed man-eaters and may even hunt men as a natural prey and

with a purpose. Such aggressive and deliberate man-eaters are undeterred by the sound of crackers fired by the forest staff.

As regards (b), the salinity of creek waters seems to exercise a profound effect on the man-eating propensity of a tiger. Strangely enough, the peak salinity in May coincides with the peak human kill in the same month. There may exist a cause-and-effect relation between salinity and the man-eating propensity of a tiger.

Thirdly, a slight prey-predatory gap exists in the buffer zone, particularly along the human habitation, which induces the tiger to stray into a neighbouring village. This incidence is maximum in February and May. Although the number of prey-animals may be sufficient, these are not easily available to the tiger because of the thickets of pneumatophores and muddy terrain. A tiger may opt for an easier prey. A deer being more fleet-footed than a pig, pigs constitute the bulk of tiger's meal.

Whatever cause or causes may be assigned to the tiger's man-eating propensity, the fact remains that the Sundarban tigers have earned the notoriety of being human-killers.

Normally, the maximum number of human kills range between 36 and 45 years in age. The largest number are killed in April each year because the largest number of honey-collectors then enter the forest for the collection of honey. Again, the maximum number of kills occur between 6 A.M. and 8 A.M. and again between 3 P.M. and 5 P.M. To the tigers, such timings are most 'auspicious' because the wood-cutters, honey-collectors, and fish-catchers either enter the forest and leave the forest during the above hours. [11] Casualties occur also at dead night, say around 11 P.M. when workers are in deep sleep after day's hard labour. It is only when the man-eaters jump out of the boat with the kill that the other inmates come to know what has happened. The boat does not tilt when the mighty 300-pounder jumps into it. Such kills cannot be recovered. [12]

Indeed, the Sundarban tigers are cunning and strategist par excellence in preying upon human beings. In this connection, attention is drawn to the following incident (1979) which makes our hair stand on end. Before entering the forest for honey, ten honey-collectors gathered on the bank of Nawabanki Khal to worship Banbibi on a bright sunny morning. The mantras were being chanted by the gunin (priest) and the tiger-god was being invoked.

Suddenly a mild thud broke the irrie silence, and Rashik Mandal (one of the worshippers) standing in the middle was seen in the jaws of a tiger, a sight akin to a fish in a cat's mouth. 'The victim' was taken towards the jungle. A search-party succeeded in recovering Rashik's half-eaten body. 'No one could solve the mystery of the tiger's sudden appearance during the worship. Such is the Sundarban tiger–elusive, agile and deadly cunning.' [13] Banbibi could not save the victim.

Here are some statistics of the persons killed by tigers in the Sundarban forest: [14]

Year	Honey Collectors	Timber Collectors	Golpata & Hental Collectors	Fishermen	Others	Total
1980-81	8	1	7	65	–	81
1981-82	5	5	5	39	–	54
1982-83	14	1	1	33	1	50
1983-84	5	2	–	19	1	27
1984-85	7	1	3	14	1	26
1986-87	9	2	–	16	1	28
1987-88	7	–	–	26	–	33
1988-89	7	1	1	18	–	27
1989-90	1	3	–	8	3	15
1990-91	2	8	–	35	–	45

The total amount of compensation paid during 1987-88 was Rs. 1·66 lakhs and during 1988-89, Rs. 1·02 lakhs.

Tigers' habitat

The ideal tiger-habitat stands on high ground and is free from inundation. The Heriteria (Sundari) and Phoemix (Hental) forests are ideal as tiger-habitatsas they stand on high ground and are free from inundation except during the high tides when they are flooded only for a short while. The densely grown Genwa also offers a good habitat to the tiger population. The thick growth and green-yellow colour of Hental serve as a camouflage to the tiger with a coat of similar colour–stripes. This is why the Hental forest is so much preferred by the tiger population as the place of their retirement. Ceriops (jele goran) and Aegialitis (Tora) furnish principal sources

of side–sheds and the narrow partings between Phoenix bushes afford the necessary shelter. The tiger habitat is subject to rhythmic variation in the water level due to tides, which result in a regular shrinkage and expansion of land–area in the habitat twice every 24 hours. It is not known how the tigers adjust themselves to the tidal rhythm in so far as their different activities are concerned. They meet their water requirements from the creeks. Tigers often change their habitat from one forest to another, preferably near human habitation, when grown old or otherwise incapacitated from running after preys. Tigers are found taking shelter in the Sajnekhali Bird Sanctuary for eating the eggs of birds falling on the ground between June-July and August-September when birds arrive at the sanctuary from different regions.

The prey-animals of a tiger mostly comprise chital deer and wild pigs. The Sundarban tiger is also not averse from eating monkeys, monitor lizards, birds, crabs, fishes, and a wide range of other organisms not normally forming the diet of a tiger. Human flesh is another palatable item of the tiger's food. If 60 per cent of a tiger's food is supplied by the pig-population, 20 per cent by the spotted deer, and the rest by monkey, crab, lizard, crocodile, fish, bird, eggs, etc.

As regards the census of the tiger population, an exercise held every two years, it is learnt from an article, 'Pug marks on sand', by Dr. Kalyan Chakravarti, published in The Saturday Statesman (Cal.ed.) dated 30.1.93, that the tiger-census is taken with the help of pug-marks and other signs, calls of tigers etc. only during the ebb-tide, avoiding inundation by high tides which occur twice a day. Tiger-census is a very risky job for the enumerators because of man-eating tigers on land and crocodiles in water. The census result show that during 1972 there were about 112 tigers, during 1979, 205 (77 males + 92 females +36 cubs), and during 1984, 264 (137 males + 115 females + 12 cubs), during 1989, 269 (126 males + 109 females +34 cubs). 'Because the Sundarban tiger–reserve records the highest concentration of tigers as a single reserve, the census results are important not only for India but for the whole world. The only indication available from the 1992 census is the collection of 15 pugmarks of tiger cubs. Detractors have expressed their doubt about the veracity of the operation. The present method of tiger census based on tiger pugmark-tracing can be fairly

accurate, but entails painstaking work at every step.' (The Statesman, dated 30.1.93, Ibid.). At present more than 800 pugmarks are believed to be discovered in the Sundarbans, compared to 450 in 1995 when the final tiger count was put at 242. The present all-India figure of tiger population is 3000. (vide The Statesman, Editoral, Cal. ed. Dated 2.12.97).

Other Principal Forest Dwellers

They include crocodiles, snakes, crabs, monkeys, bees, birds, spotted deer, wild boar, fishing cat, jungle cat, leopard cat, monitor lizards, etc. Until recently, the Javan rhinoceros, wild buffalo, and barking deer used to roam about the forests. The rhino and buffalo have been completely exterminated while the status of the barking deer is unknown. The existing forest dwellers have adapted themselves to the surrounding environment of the forest area.

Estuarine Crocodiles (Crocodilus proposus)

Tigers on land and crocodiles in water are regarded as 'the horror and beauty of the Sundarbans.' Like the tigers, the crocodiles are man-eaters but not so much habitually. Occasionally, they attack human beings and they are regarded as 'the Supreme lord of the water-bodies.' It is estimated that every year at least 6 persons are killed by the crocodiles operating in the Saptamukhi river and Dhainchi water area. These two concentrated zones of crocodiles besides, there are a few others– Chhoto Vidya river, Nawabanki and Mechua Khal, and the water areas near Patharpratima, Saptamukhi and Kultali. [15] Crocodiles lay a large number of eggs at a time and unless the croclings are destroyed at birth, streams and marshes would be choked with the teeming mass of crocodiles. The majority of the croclings are, therefore, killed at birth, and yet crocodiles have their utility. Their skin is very costly and is used as the raw-materials for many articles of luxury which have a good market here and abroad. This has led the government to organize a crocodile project at Bhagatpur under the Patharpratima Police Station. The following table presents a picture of the crocodile project between 1979 and 1991.[16]

Table
Crocodile Project in Sundarban (Bhagatpur).

Year	Date of Crocodile release	No. of males	No. of females	Total
1979	11·5·79	13	27	40
1982	22/23·3·82	3	22	25
1983	17·3·83	6	12	18
1984	10/11·5·84	6	15	21
1986	18·3·86	1	29	30
1987	29·4·87	8	22	30
1988	7/8·3·88	16	11	27
1989	20·3·89	1	12	13
1991	9·1·91	11	9	20

Snakes

The Sundarbans people have to be very wary and alert in their day-to-day life about the venomous snakes which abound in the region. They seek to propitiate the snake by worshipping the snake-god, Manasa Devi. All the three most venomous snakes—King cobra, Banded Krait and Russell's viper—are reported to be abundantly found. The Dog-faced water-snake and Hurriah are found along with other water–snakes that feed mainly on fishes. [17] The following is a list of snakes infesting the Sundarban forests.

List of Snakes [18]

Blind Snake / Common Blind Snake / Indian Python, Russell's Sand Boa / Trinket Snake / Rat Snake / Kukri Snake / Greenwhip Snake / Bronze Back / Wolf Snake/ Striped Keelback / Oliverceous Keelback, Bronze-back / Common Indian Bronze Back / Common Krait/ Banded Krait / Indian Cobra / King Cobra / Russell's Viper / Pit Viper etc.

Crabs

Another type of forest-dweller. the crabs. are a source of income to the local people who hunt them for food and money. Undaunted by fair chances of being killed by tigers and crocodiles. the lower-class people of the Sundarbans do not hesitate to risk their life to hunt crabs in the creeks with nets. since crab-hunting

promises them a means of subsistence. From November to the end of May a large number of crab-hunters gather at different canals of the Sundarbans, scanning almost every permissible creek for their harvest. Considered as a delicacy on the dining table, the crabs are also much in demand in the market for sale. Between December and February the crab–hunters catch the maximum number of crabs, often up to 150-200 a day. The hunters sell their catch at the rate of one rupee per crab to the stockists who wait at Canning. From Canning the stockists transport the crabs to different markets in Calcutta where they are sold with a good profit, the sale–price being 5 or 6 times higher than the purchase–price. Without the least trouble the stockists reap a decent profit whereas the crab-hunters have to remain satisfied with so small an income as Re. 1 per crab. They feel resigned to their fate as the will of god. The younger generation follows the ancestral profession perhaps with the unvarying spirit of resignation to the will of god. (19)

Varieties of crabs are seen in the water–bodies of the Sundarbans—Graspid crab, Fiddler crab, Sand-bubbler crab, to name only a few by way of illustration.(20) Crabs are consumed as food by innumerable varieties of fish, birds, animals and men. (21)

Monkeys

Monkeys are also seen in the jungle of the Sundarbans. During harvesting season hundreds of them are reported to approach the nearby paddy-fields to help the cultivators by carrying bundles of paddy and straw on their heads like ordinary human labourers. The monkeys of the Sundarbans are also reputed to mow paddy with scythe and to cut down trees with axe. A project to harness such animal–labour to human welfare is welcome, no doubt. (22)

Bees

Very unlike the ferocious tigers, dreadful crocodiles, and venomous snakes that strike terror into the hearts of the Sundarban-dwellers, the sweet bees welcome them to collect honey from the honey-combs which they build on the mangrove trees with fragrant flowers. Every year numerous swarms of honey-bees (Apis dorseta) migrate to the mangrove forest from March till June and build combs, producing nectar which is not only a means of subsistence of the honey-collectors but also a source of revenue to the Government of

West Bengal. Every year on an average 500 honey-collectors enter deep into the forest to collect honey, ignoring the fear of death from the attack of tigers.

The Honey-bees prefer the following trees, host-trees as they are called, for building their honey-combs on : [23]

	Percentage of the host-plant
Avicennia species (Baen)	16·0
Heritiera fomes (Sundari)	9·0
Xylocarpus granatum (Dhundul)	2·8
X. gangeticus (Passur)	1·9
Rhizophora mucronata (Garjan)	10·0
Ceriops species (Goran)	11·0
Aegialitis rotundifolia (Tora)	1·0
Excoecaria agollocha (Genwa)	39·0
Aegiceras carniculatum (Khalsi)	0·5
Sonneratia apetala (Kaera)	5·3
Bruguiera gymnorrhiza (Kankra)	3·5

The majority of honey-combs (75 per cent) are built at a very low height (2·5 meter) from the ground. The honey-combs thus built have the maximum length of 120cm with a width of 95cm and a thickness of 7·5 cm while the minimum measurements of length, width and thickness are 37-45 cm, 25 cm and 6 cm respectively. [24]

The collection of honey varies from time to time, as shown below, on the basis of the research of Dr. Kalyan Chakravorti: [25]

Time	Percentage of variation in honey-collection
April, 1-15	40·8
April 16-30	33·2
May 1-15	20·0
May 16-31	4·4
June 1-15	1·6
	100·00

Not only the variation-percentage in honey-collection, but also the data regarding the quantity of honey and wax, collected during different years, have been made available to us thanks to further researches on the diverse aspects of the Sundarbans honey-collec-

tion and the behavioural pattern of Apis dorsata. The table [26] presented below gives some idea of honey and wax collection by the honey-collectors, some of whom suffered deadly in the process.

Year	Total No. of collectors of honey and wax	No of casualties due to man-eaters	Quantity of honey collected in quintals	Quantity of wax collected in quintals
1	2	3	4	5
1963-64	1352	11	1323·8	100·1
1964-65	913	6	599·6	34·2
1965-66	1070	10	959·2	67·8
1966-67	944	10	773·0	62·6
1967-68	1140	13	889·5	128·5
1968-69	1107	19	718·6	71·0
1969-70	1016	11	680·5	57·3
1970-71	1476	7	912·9	74·7
1971-72	1495	9	890·0	72·1

The quantity of honey and wax production in the Sundarbans between 1977 and 1983, and in 1991 is given below :

	Honey in quintals	Wax in kg.
1977	161·44	52
1979	386·63	1538
1980	407·97	2019
1981	472·80	2904
1982	405·61	2360
1983	486·77	2850
1991	148·29	880

(Vide IUCN, p. 176).1993-50/60 MT valued at about 22 lakhs as collected from honey, according to the statistics supplied by Mr. A.K. Sen, Joint Director, Dept. of Fishery ,WB Government .

For relevant figures for 1988-89 and 1990-91 chapter III may be referred to in this connection.

It is needless to stress that the honey and wax collectors enter the forest at a great risk to their life. The terrain is infested with wild animals. The forests are impenetrable. The ground is extremely

soft and gets inundated twice a day by high tides. To make matters worse, innumerable sharp pneumatophores point their heads dangerously above the ground, making the movement of the honey-collectors slow, hazardous, and risky, too. The risk arises when tigers who have also a good palate for honey roam about the same area in search of honey. No less interested are the monkeys in tasting honey. Both the tigers and monkeys are known to break low-lying honey-combs. Monkeys are reputed to smear their bodies with a thick layer of silt before approaching the comb. (26A)

The honey-collectors are no less interested in the collection of wax, too, which is a secretory substance obtainable from the bodies of honey-bees. The preceding tables throws light on the total number of honey and wax-collectors, quantity of wax collected, and the number of casualties among the honey and wax-collectors during a certain a period. Indeed both the honey-cum-wax collectors are daring enough to, enter a dangerous area to earn the means of living for themselves and for their families as well.

Birds

Innumerable species of birds have made the Sundarban marshes and swamps their home, sweet home. There they sing, fly from one tree-branch to another, feed on fruits, fish etc. There they breed and roost as well. Secure in their Sajnekhali Sanctuary, the 'skylark' community of the Sundabans, like a blithe spirit, appears to fly about in a care-free way according to their sweet will and pleasure. The wood-cutters, honey-collectors, fish-catchers could perhaps look up to the birds to teach them at least 'half the gladness' to stimulate their nervous mind while undertaking the life-risking job deep into the forest. And yet the birds' ways of life in the forests are not so risk-free as they outwardly may appear to be. Strong winds damage their nests, salinity affects the source of their food-collection. Above all, there roam about various harmful animals within their breeding sites— monkey, spotted deer,various sharks, crocodiles, jungle crows, owls, wild cats, reptiles, lizards, snakes, and above all, the tigers who track the area in search of human prey. The tigers prey upon the injured birds that fall to the ground. Several species of molluscs and crustaceans, of course, supply the food of the breeding birds, including various sweet-water fish.

Most of the Sundarbans birds are carnivorous, a few being

frugivorous. Some birds like dove, parakeet, and barbet have been found to eat fruits of Keora, hental and genwa. (vide Science and Culture, vol. 39, January 1973- wild life and biology of Sundarban forest by A. B. Chaudhuri & K. Chakravarti). Further, the Cormorants and Egrets have been found to eat such fishes as Puti, Tangra, Koi, Khalsi, Chingri, Parse, Mourala, and Baing fish but the Open bills eat only molluscs (Ibid).

About 16000-17000 migratory birds visit the mangrove forests every year during monsoon and post-monsoon months from the end of June till September. These migratory birds migrate from far-off countries like Siberia. During their stay they breed and rear their youngones and, with the onset of winter, emigrate elsewhere (Naskar and Guha Bakshi op. cit., pages 195-196).

List of avian species (Birds) recorded in the Indian Sundarbans

Vernacular name	Scientific name
Resident	
Little cormorant	*Phalacrocorax niger*
Great cormorant	*P. carbo*
Grey heron	*Ardea cinerea*
Purple heron	*A. purpurea*
Indian pond-heron	*Ardeola grayi*
Cattle egret	*Bulbucus ibis*
Openbill stork	*Anastomus oscitans*
Great egret	*Egretta alba*
Intermediate egret	*E. intermedia*
Little egret	*E. garzetta*
Black-crowned night heron	*Nycticorax nycticorax*
Greater adjutant	*Leptoptilos dubius*
Black-necked stork	*Xenorhynchus asiaticus*
Black-headed ibis	*Threskiornis melanocephala*
White-breasted waterhen	*Amaurornis phoenicurus*
Bronze -winged jacana	*Metopidius indicus*
Pheasant-tailed jacana	*Hydrophasianus chirurgus*
Black-capped kingfisher	*Halcyon pileata*
Collared kingfisher	*H. chloris*
Brown-winged kingfisher	*Pelargopsis amauroptera*
Migratory species	
Spot-billed pelican	*Pelecanus philippenensis*
Northern pintail	*Anas acuta*
Common teal	*A. crecca*

Vernacular name	Scientific name
Tufted duck	*Aythya fuligula*
Common pochard	*A. ferina*
Ruddy shelduck	*Tadorna ferruginea*
Whimbrel	*Numenius phaeopus*
Black-tailed godwit	*Limosa limosa*
Little stint	*Calidris minuta*
Great knot	*C. tenuirostris*
In shallow water	
Eastern golden plover	*Pluvialis dominica*
Kentish plover	*Charadrius alexandrinus*
Eurasian curlew	*Numenius arquata*
Wood sandpiper	*Tringa glareola*
Terek sandpiper	*Xenus cinereus*
Reclaimed area	
Indian darter	*Anhinga melanogaster*
Chestnut bittern	*Ixobrychus cinnanomeus*
Black bittern	*Butoridea stellaris*
Spoonbill	*Platalea teucorodia*
Red-wattled lapwing	*Vanellus indicus*
Grey-headed lapwing	*V. cinereus*
Herring gull	*Larus argentatus (rare visitor)*
Great crested tern	*Sterna bergii (rare visitor)*
Lesser crested tern	*S. bengalensis (rare visitor)*
Sooty tern	*S. fuscata (rare visitor)*
Red junglefowl	*Gallus gallus (found in forest areas only)*
Swamp partridge	*Francolinus gularia*
Greater coucal	*Centropus sinensis*
Occasional visitors to the estuary	
Osprey	*Pandion haliaetus*
Black kite	*Milvus migrans*
Brahminy kite	*Haliastur indus*
White-bellied sea-eagle	*Haliaeetus leucogastar*
Crested serpent eagle	*Spilornis cheela*
Spotted dove	*Streptopelia chinensis*
Yellow-footed pigeon	*Treron phoenicoptera*
Large Indian parakeet	*Psittacula eupatria*
Rose-ringed parakeet	*P. krameri*
Barn owl	*Tyto alba*
Brown fish-owl	*Bubo zeylonensis*

Vernacular name	Scientific name
Spotted owlet	*Athene brama*
Magpie robin	*Copsychus saularis*
Asian paradise flycatcher	*Terpsiphone paradisi*
Black drongo	*Dicrurus adsimilis*
Treepie	*Crypsirina vagabonda*
Grey shrike	*Lanius excubitor*
Comon swallow	*Hirundo rustica*
Indian roller	*Coracias bengalensis*

Deer and Pig

The spotted deer and pigs stand conspicuous among the Sundarbans animal-dwellers. They are more numerous than all other big animals. Along with the pigs the deer constitute the staple food for tigers. The very success of the Project Tiger necessitates the preservation of the deer and the pig population. Deer are found in abundance in the Sundarbans habitat. They are abundantly available in the coastal region where they get varieties of food they need. They are seen in large numbers in Chulkati, Mechua, Bagmara and Narayantala areas. [27] To the deer the most favourite food-items constitute the Keora leaves, fruits, Genwa leaves and Dhami grass. Occasionally they eat fiddler crabs. [28]

Pigs along with deer form a complex biota of the Sundarbans region. According to the livestock census of 1972, the pig population of India was then around 6·9 million distributed among the States including West Bengal. But the exact pig population either in West Bengal or in the Sundarbans is not known. Experiment has established that pig dung acts as an excellent pond fertilizer for fish production. Fish are also known to feed directly on pig excreta which contains 70 per cent digestable food for the fish. The pig population may thus serve useful purpose for stimulating fish industry in the Sundarbans where integrated fish-cum-pig farming is advisable. [29]

The Sundarbans were once the home of Javan Rhinocerous and wild buffaloes but today they are non-existent, as stated earlier. The common jungle cat, the jackal, and small Indian civet are seen in the Sundarban forest. The common grey mongoose abounds in grassy areas. Bats are common, so also fox. [30]

Fish as a primate Sundarban forest-dweller has been already been aken due notice of in chapter IV above. The Sundarban forest-dwellers have thus a very large family but never a joint family.

Notes

1. Kumud Ranjan Naskar and Dwijendra Narayan Guha Bakshi, Mangrove swamps of the Sundarbans, an ecological perspective, p. 4. Henceforth referred to as Naskar and Guha Bakshi.
2. Naskar and Guha Bakshi, Ibid., p.2.
3. Ibid., p. 3.
4. Indian Journal of landscape systems and ecological studies, vol. 10, No. 2. Dec. 1987- Ashis Paul, Sundarban mangrove environment.
5. Vide A. B. Chaudhury and Kalyan Chakravorti, Sundarbans Mangrove Ecology and Wild life.
6. Same as FN No. 5, op cit.

6A. Vide Role of Social forestry in the Development of Sundarbans. Pub. by Social Forest Division, Sundarban Development Board, p. 15.

7. Figures compiled by Deputy Conservator of Forests, Sundarban Biosphere Reserve, W. B.
8. Acc. to popular belief, the origin of the name is traced to the royal visit of the Duke of Edinburgh who shot one Bengal tiger in the Sundarbans. Vide A. K. Mandal and R. K. Ghose,Sundarban, p. 61.
9. Vide Environment and ecology, vol.3, No.2, June 1985 Maneating behaviour of the tigers of Sundarban, pp. 243-248. Also vide A. K. Mandal & N.C. Nandi, Fauna of Sundarban mangrove eco-system, p. 63.
10. Ibid.
11. Kalyan Chakravorti, Bagh O Manus, op cit. p. 23.
12. Vide A. B. Chaudhury and Kalyan Chakravorti, Sundarbans mangrove, p. 86.
13. Vide The Saturday Statesman (Cal. ed.) dated 30.1.93. 'Pugmarks on the Sand' by Kalyan Chakravorti.
14. State Report on W. B. Forests, 1990-91, P. 70
15. Vide A. B. Chaudhury and Kalyan Chakravorti, Sundarbans Mangrove Ecology and Wild life, 1989, p. 162.
16. State Report on West Bengal Forests, 1990-91, Planning and Statistical Cell, Office of the Principal Chief Conservator of Forests, West Bengal, p. 79.

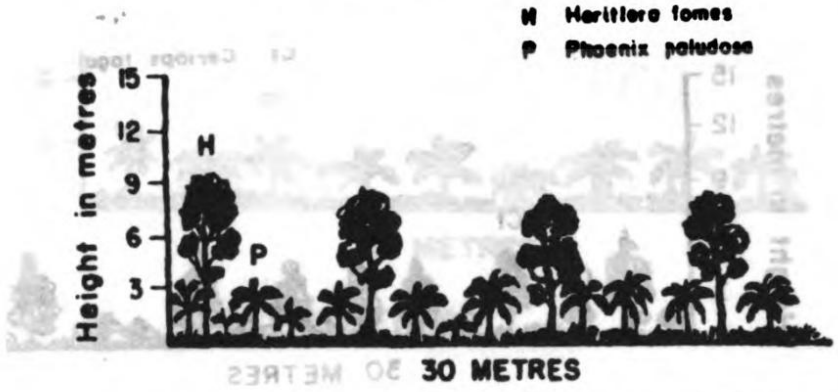
17. Vide A. K. Mandal & R. K. Ghosh, op cit. 1989.
18. Vide Biosphere Research Project Document, No. 10, Appendix.- I.
19. Vide the Statesmen (Cal. ed.), dated 4.4.92.
20. Vide A. B. Chaudhury and Kalyan Chakravorti, op cit. For a long list of crabs, Sundarban Biosphere Reserve Project Document No. 10 may be referred to.
21. A. B. Chaudhury and Kalyan Chakravorti. Ibid.
22. Manindra N. Jana, Sundarban Bichinta, vol. I, Dec. 1977, pp.32-33 .
23. Vide A. B. Chaudhury and Kalyan Chakravorti, op cit., p.143.
24. Ibid. p.144. Also Science and Culture vol. 38, No.6 1972 - Kalyan Chakravorti's wildlife biology of the Sundarban forests.
25. Vide his Manush O Bagh, p.90.
26. Vide Science and Culture, vol.38, No.6, 1972. Wild life biology of the Sundarban forests, p. 272.

26A. Ibid., p. 275.

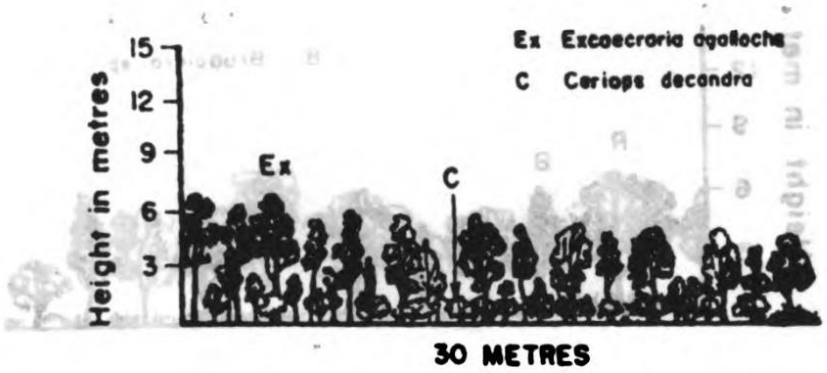
27. Vide A. B. Chaudhury and Kalyan Chakravorti, Sundarbans Mangrove Ecology and Wild life, op cit., p. 178.
28. Ibid.
29. B. K.Sharma et al, Package of practices for increasing production in fish-cum-livestock farming system in Ecological rehabilitation of Sundarban under integrated Wasteland Project.
30. Same as FN No. 27, p. 179.

MANGROVES OF THE SUNDARBANS
VEGETATION ASSOCIATIONS

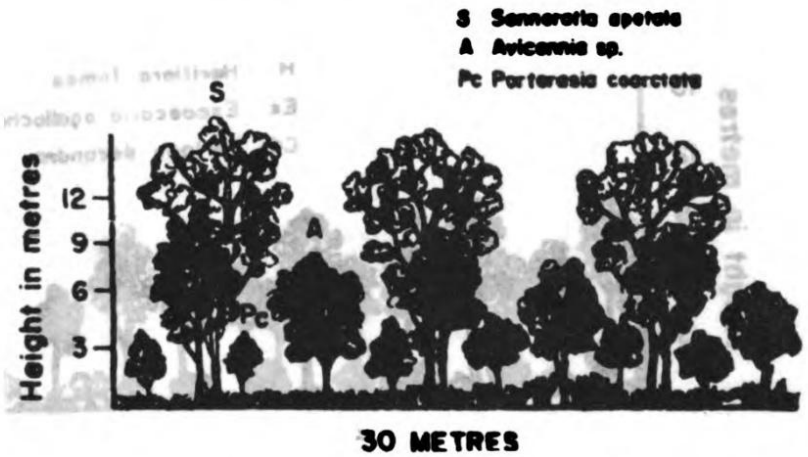
Refer : Mangroves of the Sundarbans, Vol. I, India, IVCN 1944, A. B. Choudhury & A. Choudhury



A. HERITIERA–PHOENIX ASSOCIATION



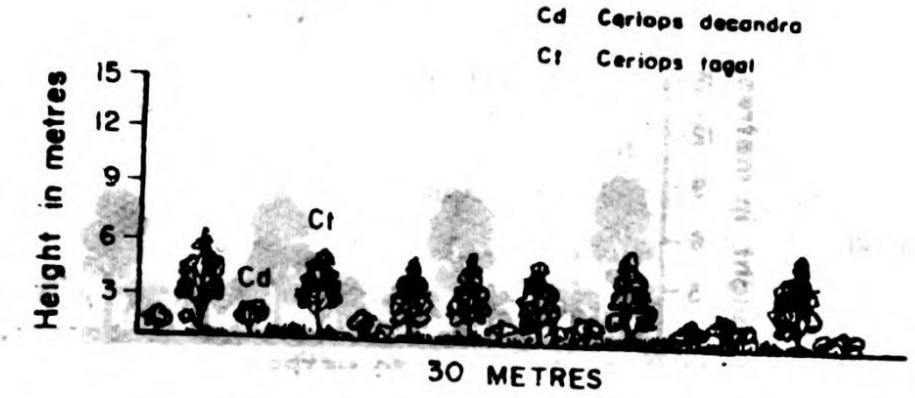
B. EXCOECARIA – CERIOPS ASSOCIATION



C. AVICENNIA SONNERATIA ASSOCIATION

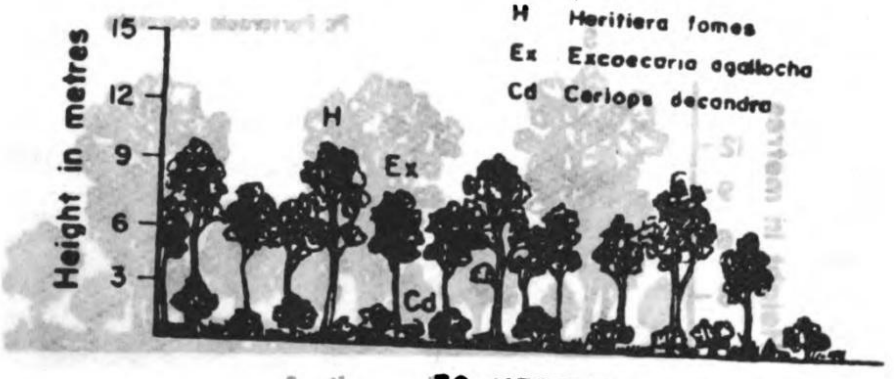
MANGROVES OF THE SUNDARBANS
VEGETATION ASSOCIATIONS

Refer : Mangroves of the Sundarbans, Vol. I, India, IVCN 1944, A. B. Choudhury & A. Choudhury

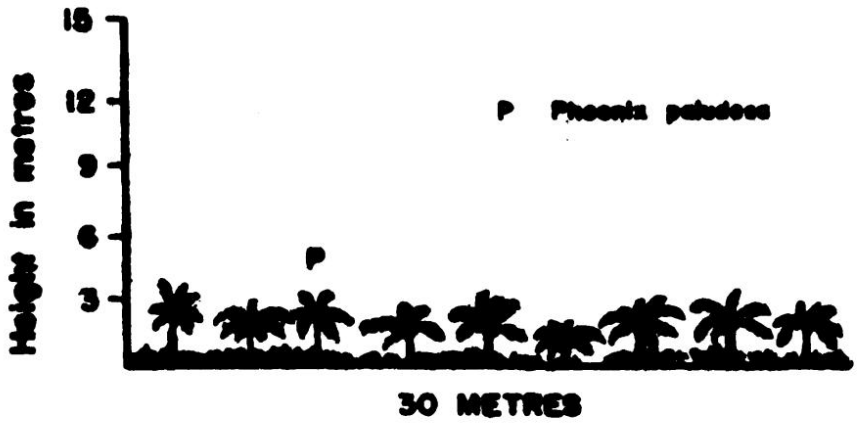


D. PURE CERIOPS

E. RHIZOPHORA – BRUGUIERA ASSOCIATION



F. HERITIERA – EXCOECARIA ASSOCIATION



6. PURE PHOENIX

GOVT. OF WEST BENGAL

SUNDARBAN BIOSPHERE RESERVE SYMBOL

FOREST DEPARTMENT

CHAPTER-VII

The Sundarbans under the Sundarban Development Board, and the Sundarbans Biosphere Reserve.

The Government of West Bengal have brought into being two organizations — The Sundarbans Development Board (1973) and the Sundarbans Biosphere Reserve (1989)-with a view to developing the Sundarbans area in its different spheres–social, economic, cultural, and ecological. To what extent the two organizations have succeeded in effecting an all-round regeneration of the Sundarbans, the people of the region are perhaps the best to judge. Here we are only to discuss the sum-total of the performances of the two organizations from an academic point of view.

Sundarbans Development Board : (S. D.B.)

Formed in 1973 with an integrated development programme, formulated initially for a 10-year period, the Sundarbans Development Board started its career with a fund of 86 crores of rupees placed at its disposal by the State Government. The fund, however, proved too inadequate to meet the expenditure of the development programme while constraint on the resources at the State level did not allow the Board to implement the 10-years plan. So, with limited resources, placed at its disposal by the State Government, the Board commenced 'formulating integrated programmes and coordinating development activities of different agencies working in the area.' A change came in 1981-82 when the Board became involved in the implementation of some development projects. The fact is that in 1981-82 the International Fund for Agricultural Development (IFAD) offered the Board some financial assistance which encouraged it to launch upon a development plan for the Sundarbans region 'with the object of bringing about improvements in the spheres of agriculture, irrigation, drainage, and water-control, communication, fish-culture and social forestry.' [1] The IFAD financial assistance was discontinued on 30 June, 1989. Thereafter,

the S.D.B. took to implementing different development programmes under the Annual Development Plans of the State Government.[2]

Under the IFAD assisted Project, the approved plan–size was for Rs. 3,185 lakhs for carrying out the activities in 528 mouzas in 15 blocks out of 1093 mouzas in 19 blocks. But the actual project expenditure was exceeded by a big margin as would be evident from the following programme-wise cost:[3]

Programme	Expenditure (Rupee in Lakhs)
Drainage and Irrigation	1,413·58
Infrastructure	1,963·19
Fisheries	199·26
Social forestry	166·76
Agriculture Extension	54·68
Management support	343·15
	4,140·62

Position in 1973–Development Strategy between 1973 and 1979

When the S.D.B. at its birth in 1973 opened its eyes, it was appalled at the backwardness of the region. Agriculture which was then — which still is — the mainstay of the Sundarbans finance was pursued in the traditional way, yielding crops insufficient for the growing Sundarbans population. There were then 737,967 acres cultivated land in the region. [4] The entire land area was, however, mainly mono-cropped or cultivated only once during the Kharif or rainy season for Aman crop and remained fallow during the rabi or winter season. Again, due to bad management of soil, the productivity of land steadily declined. The declining state of agriculture could be seen from the rising ratio of the landless cultivators. The role of occupations other than agriculture in the economy of the Sundarbans was also very insignificant. The scope of employment was shrinking in 1961. As in the 1971 Census, nearly 24 persons out of every 10,000 persons of 15-59 age-group were unemployed.[5] Again, the majority of the landless agricultural labourers must be chronically unemployed.

The backwardness of the region was also evident from the low percentage of literacy among the population. According to the findings of the techno-economic survey of the Board (incomplete), the percentage of the literate males to the total male population was then (1975-76) only 25 while the female literacy level was much lower, it being 8 per cent of the total female population of the region. The corresponding figures for West Bengal were then 43 per cent and 22 per cent respectively.[6] People suffered from lack of adequate communication facilities, specially during the rains, scores of islands composing the Sundarban delta, posing a serious transportation problem. Sweet (drinkable) water was not easily available to the dwellers in rural areas. Again, absence of electricity created a serious obstacle to the organization of industries in the region.

In face of such appalling backwardness, how could the Sundarbans be developed ? The Board accepted the challenge and adopted a development strategy: [7] (a) Land-use should be made more intensive to raise production status, readily increasing employment opportunities for small and marginal farmers; (b) Allied activities like horticulture, animal husbandry, fishery, poultry, piggery, dairy, etc, should be organized to create new avenues of productive employment; (c) Natural resources and local skill are to be utilized in cottage industries; (d) To provide minor irrigation facilities, derelict canals and tanks should be re-excavated; (e) So also, arable lands should be protected by strengthening embankments; (f) Technology for the better organization of economic activities and for creating new facilities should be introduced.

The Board considered that the chief strategy of action would, however, be to utilize non-fiscal resources or man-power in face of the availability of only limited financial resources but abundant supply of man-power for the planning of the strategy. Active mass participation in the implementation of the strategy could eliminate labour-cost but raise productivity. According to the Board, this was the foundation of 'Growth Centre Plan'. [8] The plan was expected to demonstrate how despite little financial resource production could be raised manifold only if the people combined to work and utilize the latent local possibilities. 'The pedestal of the growth centre programme was, therefore, the quality of human participation.'

The S.D.B. commenced the implementation of the Growth Centre Programme in 1974-75 in which year 17 Growth Centres were

organized. Next year (1975-76) saw the organization of 9 more ones. In 1979, 27 Growth Centres were functioning in Dakshin Barasat, Madhabnagar, Mathurapur, Raidighi, Namkhana, Bamankhali, Basanti, Canning, Kalinagar, Haroa, Ghutiari Shariff, to name only a few. [9]

The importance of the Growth Centre Programme (G.C.P.) will be evident from the following two Tables. [10]

Table I

Showing different aspects of G.C.P.

Year	No. of farmers who participated in G.C.P.	Area cultivated during dry season under G.C.P.	Subsidy granted under G.C.P. Rs.
1976-77	3,498	1937·42 Acres	5, 83,742
1977-78	17,902	9007·60 Acres	17,65,770
1978-79	31,643	14328·83 Acres	26,53,442

Table II

Showing varieties of crops cultivated and the total area under cultivation under G.C.P.

Crops	Area in acres		
	1976-77	1977-78	1978-79
Paddy	436·66	1836·45	2554·04
Wheat	183·54	527·99	1595·31
Chilly	420·36	2440·08	4159·19
Watermelon	190·05	964·07	1292·71
Sunflower	130·42	649·31	635·07
Mug	218·41	1145·53	635·07
Til	36·33	304·37	2028·93
Vegetable	276·03	774·55	858·37
Potato	18·35	97·41	185·80
Groundnut	19·97	23·55	134·58
Onion	7·30	64·40	55·00
Mustard oil	x	29·89	183·64
Soyabin	x	x	191·74

The production of the above varieties of crops redounds to the credit of G.C.P. though the Growth Centres often suffered from an overall shortage of seeds and fertilizers. In the considered opinion

of the Board, limited mechanization of agriculture is essential for success of rabi cropping in the Sundarbans. The main thrust of the Growth Centers was towards the diversification of economic activities in the Sundarbans, dependent on the cultivation of single crop. Gradually the G.C.P. gathered momentum. The Board was optimistic that, given larger funds and flexibility in the process of execution, the Growth Centres would lead to far more impressive results. Peoples' cooperation was profuse.

In 1978-79, the S.D.B. initiated a programme for the promotion of village industries in the Sundarbans such as handloom, carpentry, craft, bakery, pottery, soap, lime, spice-grounding. The Board also organized animal husbandry units–piggery, poultry and dairy on household basis, particularly to help the landless labourers.

The Growth Centres under S.D.B. also brought within its purview the scheme of promoting backyard orchard in the interests of landless cultivators. The scheme meant the introduction of the lemon and papya trees in the homesteads of landless labourers in conformity with the ecological condition of the Sundarbans.[11] It was estimated that handsome income would accrue to the landless cultivators from the sale of the fruits of the two trees.

The S.D.B. was not indifferent to the adult literacy scheme which was inaugurated on 1st October, 1977. [12] The strategy adopted in this regard was to acquaint the adult illiterates with Bengali letters and to enable them to read and write and keep simple accounts. At the start, a three-day training camp was organized for the teachers who were all recruited from the Sundarban region. Each adult literary centre was supplied with teaching materials – books, slates, blackboards, with hurricanes also, where necessary.

The S.D.B.through the operation of its Growth Centres, Programme could thus claim some credit for rehabilitating the condition of the Sundarbans people, as discussed in the preceding paragraphs. The rehabilitation with the initiative of S.D.B. covered the period from 1973 to 1979 . The S.D.B. could justly pride itself upon following achievements which stand to its credit during the period in question: [13]

Earthen road construction	346 km.
Brick-paved road construction	34 km.
Culvert construction	19
Re-excavation of cross drains	2·5 km.
Re-excavation of derelict channels	114 km.

Re-excavation of tanks	30
Repairs to river embankments	290 km.
Repairs to cross bundhs	255 km.
Construction of wooden jetty	22
Construction of wooden bridge	26
Raising of play-ground	5
Passengers' shed/market shed	3

Agriculture pursued during the Rabi season normally covered an area of 68010.77 Acres, the number of beneficiaries being 1,39,478.

In 1981-82, the S.D.B. embarked upon a development plan on a broader basis with the financial assistance from IFAD. The period of development with the financial assistance from IFAD was from 1981-82 to 30.6.89. Thereafter the assistance was discontinued. The S.D.B.'s performances during the above period are presented below : [14]

The S.D.B. took much interest in supplying controlled drainage and irrigation water through sluices during the dry season from the store of sweet-water. The Board constructed 4 such sluices called Master Sluices at Gangasagar (Block Sagar), Helen (Block Namkhana), Chilkamari (Block Patharpratima) and Moukhali (Block Gosaba). It was estimated that 6,000 hectares of land would be benefited by the proper drainage system while 900 hectares would have irrigation facilities during the rabi season. Sluices would help to provide drainage facilities and would also prevent saline-water intrusion. Till 1990-91, 161 Hume Power Sluices were completed. It is estimated that the H.P. Sluice so far completed would provide drainage facilities for about 40,000 hectares of land during Khariff season. Main drains have also been excavated, the stored water of which, it is estimated, would extend irrigation facilities to 400 hectares of farm-land during the rabi season. About 427·7 km of derelict channels have been re-excavated till the end of March 1992. The sweet water stored in such re-excavated channels has facilitated the cultivation of a second crop on more than 6,000 hectares of land. 'As a supplementary to the component of derelict channels, re-excavation of Government ponds has also been undertaken.'

Till the end of March 1992, 840 km of brick-paved roads have been constructed by the Board in the Sundarbans area. Such roads

have made transport and communication less difficult, specially during the rains and have enabled farmers to carry their produce to distant market-places for sale with more than marginal profit. Culverts and bridges have also been constructed to provide drainage and prevent the dislocation of rain-water during the rainy season. Since 1981-82, the construction of 37 jetties has been completed, providing landing facilities in the riverine Sundarbans area. The jetties at Chemaguri and Kachuberia points cater to the needs of pilgrims from all over India during Ganga-Sagar Mela each year. Sheds have also been provided in 5 jetties.

Under the IFAD Assisted Project, the S.D.B. introduced brackish aquaculture and fish-farm activities which have borne a great impact on the economy of the fishery population of the Sundarbans. Two fish-farms at Jharkhali and Moushuni islands, for instance, have been established for prawn and brackish-water fish culture' 'with the objective of boosting the production of brackish-water fish and providing technical supervision and marketing facilities in the area. Under the programme, the development of 157·5 hectares and 100 hectares of fish- farms at Jharkhali and Moushumi islands respectively has been registered.' The fish ponds would be owned and operated by local landless farmers and fishermen. On an average each participating family would own about 0·5 hectares of water area. Relevantly, the following details about the fish-production and revenue earned at Jharkhali and Moushuni from 1984-85 to 1991-92 highlight the importance of the two fish-farms:[15]

Fishery Complex	Total area (ha)	Years	Fish production in kg.	Revenue earned in Rupees
Jharkhali				
A. Under the control of S.D.B.	50	1984-85	1558·850	37,780·75
		1985-86	697·320	23,780·75
		1986-87	682·100	16,689·00
		1987-88	610·870	9,523·94
		1988-89	1645·950	75,360·76
		1989-90	1626·000	108,274·23
		1990-91	2706·195	120,023·40
		1991-92	2708·300	246,286·96
B. Under the control of the group of landless farmers/ fishermen	107·50	1986-87	3650·000	128,974·68
		1987-88	2150·000	68,432·48
		1988-89	7500·000	245,000·00
		1989-90	7401·530	282,005·86
		1990-91	12335·700	555,110·00
		1991-92	NA	NA

Maushuni				
Under the control of S.D.B.	100	1985-86	4778·845	65, 665·00
		1986-87	5994·548	101, 009·00
		1987-88	5991·305	165, 904·35
		1988-89	7009·815	106, 812·00
		1989-90	1881·200	79, 002·92
		1990-91	Fish cultural operation was suspended	x
		1991-92	7911·210	286,111·25

Under the IFAD Project of 1981-82, the S.D.B adopted the Social Forestry Programme with the primary objective of making a provision for the supply of fuel-wood to the rural folk, other objectives of the programme being to supply fodder for animals, oil-seeds for commercial use, poles and bamboos for rural households and to maintain ecological equilibrium by preventing erosion. (16) The direct impact of the programme has been the creation of employment opportunities and sources of earning for the rural people while the indirect benefits are the maintenance of ecological balance through the prevention of erosion and the improvement of soil productivity. Discouragement of poaching in the Reserved Forest area also forms an important item on the agenda of the Social Forestry Programme.

Social Forestry Programme also involves the project of plantation for the pursuit of which S.D.B. has adopted three methods — mangrove plantation, strip plantation and farm forestry.

As regards mangrove plantation, it is so very necessary because of the deforestation of mangrove trees under the colonial policy in the name of reclamation of the forest area which was essentially the Mangrove Forest area. Such deforestation produced a pernicious effect on the eco-system of the Sundarbans region. Moreover, consequent on the removal of mangrove trees, the foreshores of both sides of the tidal rivers flowing through the Sundarbans region have been under the threat of erosion and pollution. This has adversely affected not only land structure but also marine products and agricultural activities of the area. The plantation of mangroves on a large scale anew is, therefore, considered a most urgent need to restore the coastal environment to its pristine glory. The S.D.B. has already started replanting mangroves initially in the inter-tidal regions along the estuaries. Later, the plantation has been extended

along the forest-shores of embankments and on some islands while high tidal-floods inundate the land. This has had the effect of largely checking the erosion of embankments. From 1882-83 till September 1990 an area of 825 hectares was planted with mangrove trees. [17] Till March 1992, the coverage of land with mangrove plantation has been 1100 hectares.[18] The estimated figures of employment-creation per hectare of plantation is around 250 man-days and the total employment created was 2·07 lakhs of man-days for the mangrove plantation till September 1990. [19] The species of trees used in the plantation of mangroves are expected to yield fuel-wood in the main but also to supply some small timber, house-posts etc. The species introduced are Bain, Garjan, Kankra, Keora, Pasur, Dhundul.

As regards strip plantation Programme, it has been implemented generally on both sides of metalled roads, earthen roads, brick-paved roads, irrigation canals, and embankments close to agricultural lands. The main species of trees planted are Babla, Aakash Moni, Jhau, Sishu and Subabul. Eucalyptus was also planted in places found suitable for its growth. The total area covered by strip plantation amounted to 2,549 km, as shown below :[20]

1981-82	—
1982-83	200
1983-84	243
1984-85	350
1985-86	900
1986-87	522
1987-88	175
1988-89	100
1989-90	59
	2,549 km.

Besides the strip and mangrove plantations, the S.D.B. has also introduced Farm Forestry in the Sundarbans region. Actually strip plantation and mangrove plantation were included in the IFAD – assisted Sundarbans project. But later, Farm Forestry Programme was also launched as it directly involved the local people. Moreover, the S.D.B. thought that if the Farm Forestry Programme were introduced, Social Forestry project could be extended to the very

courtyards of villagers themselves. The World Bank Mission also approved the project considering the aptitude of the Sundarbans people for forestry. According to the Farm Forestry programme, seedlings were distributed free of cost among the farmers for plantation in their own land. The following species have also been distributed—Eucalyptus, Sishu, Mehogany, Jhau, Krishnachura, Mahaneem, Akasmoni, Kajoo, Subabul, etc. Such trees besides, fruit grafts of lemon and sapota have also been distributed to those who deserved them on the recommendation of the Panchayat institutions. The Farm Forestry programme was found to be the most important item of the Social Forestry Project because of its community participation.

'The S.D.B. felt the urgency for protecting the Sundarban islands from storms and accordingly introduced 'shelter-belt plantation' on the island sides of the embankments for the first time. For the protection of both the embankments and islands the Board provided for 'toe-line plantation' on the river-side of the embankments.

The impact of the Social Forestry Programme appears to be quite impressive on the poverty-stricken farming community of the Sundarbans area. The Programme has generated confidence and community-participation and has afforded opportunities for direct and indirect employment through the creation of community and individual assets. Women's participation in the Programme has also been assured through the involvement of Mahila Samities for raising seedlings' [21] Further, the Social Forestry activities have reduced the incidence of trespassing on the Tiger Project area and discouraged the villagers from poaching in the adjacent Reserve Forest.

Another noteworty achievement of the S.D.B. under IFAD-assisted Project has been the development of agriculture through Agricultural Extension Programme. With a total geographical area of 438,193 hectares including the cultivable area of 299,419 hectares, [22] the Sundarbans region is, as stated earlier, mainly mono-cropped, the main crop being Kharif paddy. Agriculture is the mainstay of the subsistence of the Sundarbans people, about 90 per cent of them being dependent upon agricultural pursuits. The main agricultural problems relate to salinity, water-logging, inadequate drainage during monsoon, want of irrigational facilities, low investment in farming activities by small and marginal farmers to whom most

of the holdings belong. The Board addressed itself to the task of removing such impediments to agriculture as far as possible. For instance, drainage system has been improved, irrigational facilities increased, 40,000 hectares of land have been brought under better drainage system in the khariff season while irrigation potential has been created for 7,300 hectares of land for rabi cultivation.[23] For the availability of salinity-free water for agriculture the Board has excavated reservoirs which are usable for cultivation after 2/3 years of excavation. Again, in the interests of small and marginal farmers the Board decided to supply improved agricultural inputs in the rabi season. Under the Agricultural Extension Programme, the Board has granted 50 per cent subsidy for seeds and fertilizers for the selected beneficiaries during the season of rabi cultivation. The beneficiaries are selected in consultation with the local Panchayati members and the MLA's. The scheme is executed through Growth Centres of the Board, already referred to, under the supervision of Project officers. Also, cocoanut saplings were distributed in 1991-92 among 13,500 [24] small and marginal farmers, bargadars, and pattadars to boost their present economic condition. The scheme of distributing cocoanut saplings was, of course, introduced for the first time in 1980-81. From 1980-81 till 1991-92, 300,905 cocoanut saplings were distributed among 2,64,410 beneficiaries.[25]

The Board had its own scheme for Animal resource development. Towards this end, necessary fund was provided in 1991-92. Three cross-breed bulls were preserved in Patharpratima, and Sandeshkhali-II blocks for breeding purpose. For improving breeding stock, bucks and rams were distributed in 9 blocks, namely Sagar, Patharpratima, Mathurapur-II, Jaynagar-II, Canning II, Basanti, Gosaba, Sandeshkhali-II, and Hingulganj. With a view to catering to the veterinary needs in the Sundarbans a transport subsidy of 48 thousand rupees was given to Veterinary Services Directorate. A further subsidy of Rs. 3·29 lakhs was sanctioned in favour of the above Directorate for the establishment of 5 Artificial Insemination Centres. [26] The supply of drinkable water in the rural areas of the Sundarbans posed a serious problem to the S.D.B. Accordingly in 1991-92 it undertook a scheme of sinking tubewells under its Rural Water Supply Programme in the Sundarbans region for the supply of drinkable water in the deficient mauzas of the region. A sum of 36 lakhs of rupees was accordingly allotted to the Zilla

Parishads of the North and South 24-Parganas at the rate of 18 lakhs each for executing the scheme of sinking 187 tubewells in all the blocks of the region. [27] Interestingly, Solar Photo-Voltaic Street lights (25 units) were installed in 1986-87 in the blocks of Sagar, Patharpratima, Basanti, and Gosaba. These were provided by the Department of Non-Conventional Energy Sources, Government of India. Unfortunately, some of these were damaged by cyclonic storm while the rest have not been functioning due to the expiry of the life of storage battery.[28] In 1991-92, Solar Photo-Voltaic Water pumping systems were introduced — 5 in Sagar block and 5 in Basanti block. The capacity of each is to pump out about 5,000 litres of water per hour, depending on the availability of sunlight. The approximate coverage of each pump is 1 hectare.[29] Again, the District Rural Development Agency (DRDA) of the South and North 24-Parganas has been imparting vocational training to the destitute village women-folk in groups and providing subsidy during the post-training period for setting up production centres in some blocks of the Sundarbans region. The Sundarban Development Board, on its part, sanctioned Rs. 13,19,200 to D.R.D.A for the construction of 18 work-sheds in the blocks of Hasnabad, Hingulganj, Sandeshkhali-I, Kultali, Jaynagar-I and II, Canning-I, Mathurapur-II, Namkhana, and Sagar for carrying on group activities by trained rural women-folk. [30]

The achievements of the Sundarban Development Board under the IFAD-assisted project thus seem enormous, at least on paper. Future will determine to what extent the different provisions have been implemented and how far the people of the Sundarbans have stood to benefit from the Board's well-meaning socio-economic programmes.

The World Bank Review Mission's comments on the performances of the S.D.B. immediately before the expiry of the Project period deserve attention: '.... The present project has beyond any doubt brought many broad benefits to extremely poor and isolated villages. Mindful of the underprivileged character of the Sundarbans, Government of West Bengal is intent on pursuing a continuity development strategy for this area. The Mission recommends that Government of India explore the various funding sources available to secure suitable financial support for such an effort.' [31]

The IFAD-assisted Project-period came to an end on 30.6.1989

when the financial assistance of IFAD was discontinued. Since then the development activities of the S.D.B. are being financed by the State Plan Budget. Since the discontinuance of IFAD, the S.D.B. has been implementing different development programmes under the Annual Plans of the State Government.

The approved plan proposals of the S.D.B. for the years 1990-91 and 1991-92 were for Rs. 864 lakhs and 939 lakhs respectively. During those years some additional programme elements like 'tourism, water-supply in rural areas, animal resource development and cottage and small-scale industries including special programme for women' have been taken up apart from the activities already initiated in the IFAD Project. In the agricultural sector some innovative schemes like mushroom cultivation have been initiated. Under Social Forestry programme the main emphasis has been laid on 'ecological improvement and coastal stabilization.' In consideration of the successful implementation of the IFAD- project, the Sundarban Development Plan – Phase II-has been framed. All the 19 blocks of the region covering 1093 mouzas have been brought under the purview of the phase II plan. (32)

The Sundarban Biosphere Reserve (S.B.R.)

Like the Sundarban Development Board, the Sundarban Biosphere Reserve was organized with the grandiose scheme of promoting the development of the Sundarbans on a durable and attractive basis.

Biosphere refers to the zone of the Earth where living beings exist in constant interaction with flora and fauna through energy and metabolism. Among the living beings Man was the last to arrive in the Universe of Nature but within a very short period became master of the situation, lording it over the entire kingdom of plants and animals by virtue of his superior intelligence and strength of character. Although Man largely utilized both flora and fauna for his own consumption, he took care to maintain a natural balance between the consumer and the consumed lest his unlimited consumption should result in the short supply of his requirements of animal and plant life. But during the last two centuries the increasing human population and the consequent continuous growth of human consumption have largely intensified the pressure on earth's resources to such an alarming extent that the very existence of

human life stood threatened. Against this backdrop was introduced 'the Man and Biosphere Programme' of UNESCO in 1971, intended to initiate new thoughts for developing a basis for rational use vis-a-vis conservation of resources for the improvement of the relationship between Man and Environment, so as to predict the consequences of to-day's actions on tomorrow's world and thereby to increase man's ability to manage efficiently the natural resources of the Biosphere.' (33)

The Man and the Biosphere (MAB) Programme is 'a world-wide programme of international scientific cooperation between man and his environment from polar to tropical regions and from sparsely populated regions to dense human settlements. Research under MAB Programme is designed to provide the information needed 'to solve practical problems of resource management. It also aims at filling up gaps in the understanding of the structure and function of ecosystems and of the impact of different types of human intervention? The International Coordinating Council which supervises the MAB programme decided in its first session in 1971 that one of the themes of the programme was to be 'the conservation of natural areas and the genetic material they contain.'(34) Under this theme was introduced the concept of the Biosphere Reserve which was intended to be 'a series of protected areas linked through a coordinated international network which would demonstrate the value of conservation and its relationship with development. The concept was innovative because of this network character and because it combined Nature conservation with scientific research, environmental monitoring, training, demonstration, environmental education and local participation.' (35)

The first Biosphere Reserves were designated in 1976. The network has grown since then until 1984. At present there are 269 numbers of Biosphere Reserve created in 74 countries. In India, 14 numbers of Biosphere Reserve are proposed to be set up in 12 different Bio-geographic areas. The Sundarbans Biosphere was declared in 1989 as the 5th Biosphere Reserve of India.

The Sundarbans Biosphere Reserve (SBR) covers 9,630 sq km, being the total areas of the Sundarbans, and, true to the nature of Biosphere Reserve, is intended to promote the overall well-being of the Sundarban residents while preserving plant and animal life and maintaining ecology of the region for sustainable production

of natural resources. The entire area lies to the south of Dampier-Hodges line of the Mangrove forest. In other words, the Dampier-Hodges line forms the northern boundary of the S. B. R. A detailed area-statement of S.B.R. is presented below : [36]

Biosphere Reserve	— 9,630 sq km :	4264 sq km	Mangrove forest area
		5366 sq km.	Non-forest or Inhabited area
		9630 sq km.	
Forest area	— 4264 sq km :	2585 sq km	Sundarban Tiger Reserve (S.T.R.)
		1679sq km	Area under 24-Parganas, Divn.
		4264 sq km.	
S.T.R.	— 2585 sq km :	1330 sq km.	Core area or National Park, exclusively meant for Tigers
		362 sq.km	Sajnekhali sanctuary for bird population only.
		893 sq. km.	Buffer forest area
		2585 sq km.	
Area under 24-Parganas Division	— 1679 sq km.	38 sq km.	Lothian Sanctuary for bees, pig and deer
		6 sq km.	Halliday Sanctuary for bird,deer, pig
		1635 sq km.	other forest Reserve
		1679 sq km.	

Non-Forest area, 5, 366 sq km. – fringe villages for human habitation.

The S.B.R. area essentially contains within itself a Core area, a Buffer area, 3 Sanctuaries of Sajnekhali-Lothian-Halliday, the Restoration Zone for Forestry in different locations where forests are to be restored towards a good mangrove eco-system, and the Manipulation zone for Agriculture, which is the inhabited area in the 19 blocks where agriculture is pursued and measures for agricultural development are adopted.

How is it that the Sundarbans region was selected a suitable area for the Biosphere Reserve ? The S.B.R. aims at the conservation of resources for the improvement of the relation between men and animals, the protection of plant life and animal life against human atrocities, the protection of men against wild animals and also for the maintenance of an ecological balance in the region. Above all, the Sundarbans area is a backward region. There the people are poor and illiterate. The advancement of such a region and the economic and educational regeneration of the people there constituted important items on the agenda of the Biosphere Reserve Programme. In fact, the Biosphere was meant for wishing them all well—men, animals, and plants there. The region compelled attention for the welfare of them all. It was, therefore, a good field for Biosphere experiment.

Again, with the unique Mangrove forest measuring 4,264 sq km, the Sundarbans region has been considered suitable for selection as a Biosphere Reserve. The Biosphere Reserve will act as a preventive measure against the deforestation of the Mangrove trees by the thoughtless rural folk and against the destruction of the Mangrove eco-system. Also, under the Biosphere Reserve, the Mangrove forest will flourish as the nursery for Fish and Shellfishes while its responsibility for the coastal fishery of the whole of eastern India would increase. Again, the Sundarban forests, with so many wild forest-dwellers, can give them the protection they need only under Biosphere Reserve–Tiger, Crocodile, Fishing Cat, Salvator, Lizard etc. 'The aquatic endangered mammals like Gangetic Dolphin, Black Finless Porpoise which thrive within the mangrove creeks need conservation.' 'A number of migratories finds like Golden Plover, Wimbrel, Curlew have made the tranquil Sundarbans swamp their semi-permanent homes and are sometimes sighted along with their chicks. White Bellied Sea Eagle is also a permanent dweller here.' 'The Horse-shoe or King-crabs are visi-

tors of south-east Asian coasts as well as the Mangrove coastlines of Eastern India down to Chandipur of Orissa. The Sundarbans needed the introduction of Biosphere Reserve in the interest of such mammals and birds.' Again, 'owing to the king crabs' massive slaughter for medical reasons (to fight against cancer) the Biosphere Reserve envisages their immediate conservation and artificial breeding.'[37] Also, the mangrove trees, if protected against thoughtless fellings, can save the Sundarbans region and neighbouring areas like Calcutta from cyclones and storms, loss of life and property, such protection being a gift of the Biosphere reserve. Moreover, the sustenance of the coastal fishing of the whole eastern India requires the conservation of mangrove forests. For the sake of such conservation of the mangrove forest the Sundarbans region was chosen as a suitable area for Biosphere reserve. The mangrove destruction in Singapur ruined the coastal fishing.[38]

Another significant reason why the Sundarbans region was selected the Biosphere Reserve was its potential for research and training activities. The Sundarbans offer a virgin field for the research workers. 'The in-depth studies on any of the aspects (of the Sundarbans) are in primitive stage as yet. The best studies have so far been made by the Sundarbans Tiger Reserve, and by Sagar Marine and Estuarine Research Institute located on the westernmost island under the principal investigation of Professor Amalesh Chaudhury, Department of Marine Science, Calcutta University.'[39]

Aims, objectives and activities of the Sundarban Biosphere Reserve.

The Sundarban Biosphere Reserve has significant aims and objectives as items on its agenda. Its activities towards achieving such aims and objectives are laudable enough. The Sundarbans Biosphere was brought into being as a multi-disciplinary project for an all-round development of the region where massive afforestation programme has been taken up for socio-economic development, eco-restoration, eco-development, soil-restoration against degradation, water-conservation, checking the erosion of river and pond-banks and of coastal area, joint forestry management of (JFM) with peoples' cooperation, adoption of large-scale mangrove afforestation etc, some of which have been high-lighted below:[40]

Eco-development

The Biosphere Reserve is very active in this field. A large-scale mangrove plantation has been created. Forests can hardly be conserved in isolation due to population boom. Thus in order to create a contented buffer population on the fringe of mangrove forests several measures have been adopted such as follows : (a) Tide-fed aquaculture for Tiger-Prawns and Mullets through village and Panchayat organizations; finding this item quite remunerative, major thrust has been given to it; (b) Tide-fed Mariculture for crabs and edible oysters; (c) Mushroom culture (oyster mushroom, button mushroom); (d) Api-culture or encouragement to the Mouli community (community of honey-collectors) on the fringe of villages to rear the Rock-bees of Sundarban (Apis dorsata) and common bees (Apis indica) in the apiary-boxes on the fringe of the forests, so that they can continue this box-culture for more than 6 months in a year with no risk or hazard, honey-collection in forests being at present restricted to only 2 months; encouraging and satisfactory results having been achieved in the very first year, the box-culture is proposed to be extended to larger areas involving larger population; (e) Distribution of fuel-efficient smokeless Chullas (ovens) to minimise the daily consumption or requirement of fuel among the fringe villagers; the smokeless Chullas have consequently become very popular within a short time; (f) Solar cooker, windmill etc. as alternate sources of energy are being distributed; (g) Wood-carving and woodwork; small–scale cottage industries for tables, handles of sticks and umbrellas, table-lamps, ashtrays and small furniture etc. with suitable timber such as Dhundal are encouraged; artisans are also locally available in some areas. (h) Tannin from mangrove bark, a lucrative cottage industry; (i) Distribution of high-yielding fruit-trees such as cocoanut, guava (local varieties), safeda (local), citras (local), papya (Ranchi variety), Karamcha (local), Jack-fruit (local). (j) Health and family welfare schemes also loom large on the agenda of Biosphere Reserve.

Education, Awareness, Eco-Tourism

The Sundarban Biosphere Reserve's achievements in such fields are also noteworthy. The S. B.R. organizes interpretation trips and camps for local people and for schools and college students. It also

organizes institutions for the better understanding of the Biosphere-project objectives and mangrove eco-system. Again, Audio-visual lectures and seminars are organized as part of the awareness programme. Training is backed up by field visits in the Reserve. Indeed, 'Biosphere Reserves can serve as important field centres for education and training of scientists, resource-managers, and protected-area administrators, visitors and local people. The strong emphasis on developing educational and training programmes within the Biosphere Reserves is probably unique. The nature of these programmes depends on the particular conditions, capabilities and needs of the Biosphere Reserve and the surrounding region. However, the following kinds of activities are generally encouraged— academic and professional training, environmental education, demonstration, and training for local people supplemented by the provision of employment opportunities.

A 'Marine Park' has been proposed for eco-tourism on the south of the Sagar Island with facilities for inter-island trips. In order to get familiarity with Mangrove plants, Mangrove arboretums are being established. There is one such already at Canning area.

Eco-restoration

About 450 sq km of vacant lands within the inter-tidal zone of river banks and newly-formed islands (char-land) have been identified for mangrove afforestation. The appropriate technology for successful artificial regeneration of mangrove including nursery techniques, where necessary, has been finalized. During the last one decade about 800-900 hectares of mangrove plantation had been created with only between 3 and 4 species. In the very first year of the functioning of the Biosphere Reserve in 1989, 800 hectares were planted, and in 1991, about 1200 hectares, with as many as 12 to 16 numbers of mangrove species. Attempts for quicker eco-restoration in the sea-facing and distant areas by aerial seeding were also made for three consecutive years (1990-1992) in Kakdwip, Dia island, and Sagar island. Restoration through natural regeneration by flooding and imparting intensive protection has also been prescribed through S.B.R. programme.

Protection and conservation

Under the S.B.R. programme, the bank erosion is prevented by

putting 'Bamboo porcupines' which encourage new silt deposition so that quick restoration work can follow the process, when ready. Watch towers and boat patrolling are an important part of S.B.R. activity. Local folk are advised not to destroy lesser mullet and prawns in the course of collecting prawn fingerlings in rivers and creeks.

Research and monitoring

The S.B.R. is also active in the field research-work concerning mangrove forests and the eco-system and accordingly undertakes action-oriented research programme. Some of the areas of research are mentioned below by way of illustration:

(1) 'Breeding of rare terrapin at Sajnekhali or Pakhiralaya campus.

(2) Studies in social behaviour and breeding habits in the wild for fishing cat, leopard cat.

(3) Researches in Horse-shoe crab (Living Fossils), considered important in medical science for fighting against cancer.

(4) Studies in the behaviour of man-eating tigers and in their habit of straying into human habitation.

(5) Soil diversity studies now undertaken by the Central soil Salinity Research Institute, Canning town (CSSRI)

(6) The CSSRI Institute is also working on the cultivation of saline paddy since the yield of paddy in SBR is low.

(7) Another significant field of research is the apiculture of Rock-bees (Apis dorsata) of S.B.R. with a view to finding out ways and means towards avoiding tiger-human conflict in the Sundarbans.

(8) Artificial regeneration technique of mangrove plants which tends to fruitful results. Further improvement with the help of Bio-technology is in progress.

(9) 'Researches on pollution of estuarine mouth and bio-accumulation studies in edible oysters, fishes, prawns etc. have been given priority'.

Sociology and Archaeology

Research in sociology explains how out of common fear of dan-

gerous forest-dwellers like tigers, crocodiles, snakes etc.the Hindus and Muslimsworship the same gods and goddesses irrespective of their religious faith, such as Banbibi, Dakshin Rai, Panchanan Pir, Gazi Saheb, Kalu Rai, Sha Jungli, Manasa, Sitala, Olabibi etc. It is, no doubt, out of superstitious belief that the Hindus and the Muslims worship the same gods and goddesses,praying for protection in face of attacks from tigers etc.

Archaeological researches in the Sundarbans area have led to the discovery of so many ancient sites of civilization dating back to the pre-Christian era in such areas as Harinarayanpur, Atghara, Chhatrabhog, Khari, Jatar Deul and others, as noticed earlier in chapter II. Researches in such archaeological discoveries are in progress under different Museums and Sangrahalays, prominent among them being the Sangrahasala by Kalidas Dutta, Calcutta University Asutosh Museum. Museum at Thakurpukur, State Archaeological Museum at Behala etc.

The Sundarban Biosphere Reserve takes special care of the forest-dwellers as would be evident from the establishment of National Park, and 3 wild life sanctuaries, namely Sajnekhali, Halliday island, and Lothian island, all within the S.B.R.

Perhaps the most important activity of the S.B.R. is bent on the protection and conservation of the Sundarban Mangroves Eco-system and that too, with the active and whole-hearted cooperation of the fringe dwellers. Along with the close and conscious cooperation and collaboration among different Government Agencies, responsible for the planning and implementation of the Biosphere Project involving Mangrove Eco-system, there should be formed Forest Protection Committees among the fringe-dwellers. Such steps are expected to ensure proper conservation, utilization, and management of mangroves, and the maintenance of mangrove eco-system on which the traditional communities are dependent for their livelihood.

It is evident from the aforesaid analysis of the activities of the S.D.B. and S.B.R. that the S.D.B. is primarily concerned with agriculture (including irrigation, water-supply, drainage, fishery and fish-farms), social forestry programme with its direct impact on employment opportunities, the supply of fuel-wood to the rural mass, cottage and small industries, construction of buildings,repairs to roads, embankments, culverts, bandhs, bridges and jetties with com-

munication facilities, all these meant for the material well-being of the Sundarban people.

The S.B.R. on the other hand, is mainly concerned with Mangrove eco-system, eco-restoration, eco-development, protection of wild life, spread of education through seminars, lectures, and audio-visual programme, research in sociological and archeological problems etc. – all intended to give the Sundarban people food for their mind and thought. A happy marriage between the two bodies in their programmes and activities is expected to change the face of the Sundarbans. Let to-morrow be better than today. (41)

Notes

1. Introduction by S. R. Bhowmik, Member-Secretary and Project-Director, S.D.B. in Annual Administration Report 1981-82 to 1991-92, S.D.B.
2. Ibid.
3. Administrative Report of S.D.B. 1981-82 to 1991-92.
4. Sundarban Development Board, a profile, September, 1979, p.2
5. Sundarban Development Board, a profile.
6. Ibid.
7. Ibid.
8. Ibid.
9. vide Sundarban Development Board,a profile, 1979, p.6 for a complete list.
10. Ibid., pp. 7-8.
11. Vide Sundarban Development Board, a profile, op. cit. p. 26.
12. Ibid.
13. Administration Repoart of the Sundarban Development Board 1981-82 to 1991-92, p. 11.
14. In presenting S.D.B. 's performances during the IFAD period I have drawn on the Board's Annual Administration Report 1981-82 to 1991-92, as and when necessary.
15. Vide Board's Administration Report, Ibid. p. 26.
16. Ibid. Also a Pamphlet entitled Role of Social Forestry in the development of the Sundarbans, published by Social Forest Division, S.D.B.
17. Vide FN 16.
18. Vide Administrative Report
19. Vide FN 16.
20. Vide FN 16.
21. Vide Annual Administrative Report p. 8. Ibid.

22. Ibid.
23. Ibid.
24. Ibid.
25. Ibid.
26. Ibid.
27. Ibid.
28. Ibid.
29. Ibid.
30. Ibid.
31. Ibid
32. Ibid.
33. G. S. Mandal. IFS, Sundarban Biosphere Reserve, in the booklet Role of Social Forestry, p 14.
34. Sundarban Biosphere Reserve. Project Document No. 10.
35. Ibid.
36. Figures compiled by Deputy Conservator of Forests S.B.R., W.B.
37. Biosphere Reserve Project Document No. 10. p. 18.
38. !bid. p. 18.
39. Role of Social Forestry in the development of Sundarban– Published by Social Forestry Division S.D.B.-- article by G.S. Mandal. IFC —- Sundarban Biosphere Reserve
40. Vide the role of Social Forestry in the development of Sundarban.
41. The analysis is based mainly on the Sundarban Administrative Report 1981-82—1991-92 and the booklet on Role of Social Forestry in the development of Sundarbans.

CHAPTER-VIII

Conclusion

When I planned to write a monograph on the Sundarbans after the publication of my 'Salt Water Lake and Salt Lake Township,' my idea was to make the fringe-villagers—mainly the Scheduled castes and Scheduled tribes — and the forest-dwellers like Panthera Tigers, Apis Dorseta, in the main, the heroes of my narrative, projecting at the same time how unarmed men and women, though living in close proximity to the man-eaters and other ferocious species, could live together in co-existence and in harmony with Nature. As my work progressed, however, I got hold of some useful papers relating to reclamation, ancient civilization of the Sundarbans, fishery, mangrove eco-system, etc. So, I decided to enlarge the arena of my discussion by including the above topics within the scope of my work. And yet the fringe-villagers and the forest-dwellers remained the central theme of my discussion. The Scheduled castes and Scheduled tribes belong to the the agricultural society and are mostly agricultural labourers, as highlighted earlier. They are hardly able to live above the plimsoll line of poverty throughout the year and are necessarily pressed into risking their life to supplement their income as woodcutters, honey-collectors and fish-catchers. They have, however, never failed to rise to the occasion to record their protests against any unjust treatment of them. The role of the peasantry of S.C. and S.T. in the Tebhaga movement at Lalganj, Chandanpiri, Budhakhali, all under the Kakdwip Police Station, and at Sandeshkhali has stood the test of history. Who could forget the heroic resistance offered by Gajen Mali, Aswini, Ahalya, Batasi, Uttama, Sarojini, Pakhi, and of many others who died for a cause and became martyrs for their opposition to the blood-thirsty authorities and their henchmen— the Ijaradars, Chakdars, Jotdars and Bargadars? The peasant agitators in the Tebhaga movement thus demonstrated that it would be highly unjust to accuse their class of being docile and meek.

of trudging at a wearied pace with whatever load on their backs as long as there was the last breath in their nostrils, without shouting or protests. The peasants involved in the movement, it is true, did not succeed. And yet they did not abjectly surrender but died fighting to the last. Their mind remained unconquered and unconquerable, and their sprit unsubdued. Their agitation hangs a moral and adorns a tale.

Men and animals crowd the pages of this monograph but men had appeared in the terrain, traditionally called the Sundarbans, long before the animals. In fact, the Sundarbans have a hoary antiquity, which is traceable to the pre-Christian epoch. Again, the discovery of ancient relics of art and culture at different places of the region like Harinarayanpur, Chandraketugarh, Atghara, Chhatrabhog, Khari, Jatar Deul and others carries back the tradition of the Sundarbans civilization to the pre-Christian era, thereby disproving the colonial pretension that the Sundarbans were discovered only during the colonial regime and that the region emerged from darkness to light after the establishment of colonial rule there. In fact, the Sundarbans are no human creation. The terrain has ever existed as a freak of nature and the question of its discovery, therefore, carries no sense. Formed of alluvium deposits over the centuries past, the Sundarbans delta is an endowment of Nature to man. It did not take long for the delta to be overcrowded by non-mangroves, mangroves, and mangrove associates till at last the terrain acquired the present shape. It was the policy of government to reclaim the Sundarbans for human settlement, agriculture, and, above all, for revenue to the State. In fact, government began to earn revenue from diverse forest sources such as wood, honey, wax, and fisheries as shown in an earlier chapter.

Obviously, the Sundarbans' economic structure is built on agriculture, fishery, and forest-resources. Agriculture suffers from salinity of water borne by the estuarine rivers and creeks like Raimangal, Kalindi, Gosaba, Vidyadhari, Harobhanga, Vidya, Matla, Thakuran, Saptamukhi. The alluvial soil of the region, if adequately protected and treated, is capable of bumper production but the efforts in this direction do not appear to be very much successful. In most areas, agriculture is characterized by mono-cropping. The plot of land on which mono-cropped Aman or Aus is grown and harvested has to be kept unused for sowing till the next

season, with the result that the paddy-production needed for the growing population of the Sundarbans falls short. The number of agricultural labourers has been gradually on the increase. The excess of landless labourers over landed cultivators is a sure index of poverty. Such landless labourers have per force to eke out their living by catching fish, cutting wood, and collecting honey and wax. But such a living is by all means risk-taking because the labourers have to enter deep into the forests for their job, where tigers, crocodiles, snakes, etc. await to settle accounts with them. Labourers' income from these sources is not sufficient for meeting their wants over the year. Again, the system of paddy-cum-fishery has further adversely affected their economic condition. Such a system being found more lucrative than the ordinary cultivation of soil, it has been the practice of many zamindars and big land-owning cultivators to lease out their cultivable plots for fish production, the details of which have been supplied earlier in chapter IV. The point is that such a system, though a good game for the landowing-business men, is death to the vast majority of the social class who have no lands to subsist upon. They find to their utter dismay the price of rice shooting up because of short supply through insufficient production. In such a contingency, they have to borrow money to meet their domestic needs. They have perhaps to die without being able to clear their debt, bequeathing such a burden of debt as a legacy to their children.

Again, wood obtained and obtainable from the varieties of mangrove trees in the Sundarbans is a decent source of income but the income of the woodcutters from forest resources is not sufficient to enable them to meet their wants. They are pressed by circumstances into floating loans which perhaps remain unpaid during their lifetime. It is, however, undeniable that, if properly exploited, the resource of the forests could improve the State's financial position. For revenues earned by government under different heads like wood, honey, wax, fishing a reference is made to chapter III.

Thus the Sundarbans region is rich in resources but paradoxically the people are poor. The region is not industrially advanced either, agriculture being thus the sole means of the peoples' livelihood.

On the whole, the common people remain within the poverty belt. They have their homely joys and destiny obscure, observe

different Hindu and Muslim festivals and participate in different fairs. They worship the same forest and animal gods and goddesses irrespective of their religious beliefs—Banabibi, Dakshin Rai, Panchanan Pir, Ghazi Saheb, Kalu Rai, Shah Jungli, Manasa, Sitala, Olabibi etc. It appears that the society of the Sundarban people unlike the society of the people of North 24-Parganas is based on Hindu-Muslim unity and on a blend of Hindu-Muslim culture.

The Sundarbans cannot be thought of apart from the Mangrove eco-system. If research scholars today turn their faces towards the Sundarbans, it is mainly to study the mangrove eco-system and its relevant aspects. Many a devoted scholar like Blasco, Curtis, Chapman, Seth, Prof. Amalesh Chaudhury (Calcutta University) have devoted much of their time and energy to solve the mystery of mangrove eco-system and to study the various aspects of estuarine biology of the Sundarbans. Prof. Amalesh Chaudhury, in particular, has made an outstanding contribution to the study of the mangroves. Of late, two scholars, Kumud Ranjan Naskar and Dwijendra Narayan Guha Bakshi have published their 'Mangrove swamps of the Sundarbans, an ecological perspective,' a useful dessertation on the subject. Mention is made of two other publications of great merit on the subject – 'A.K. Mondal and R.K. Ghosh, Sundarban, a Socio-Bio-ecological study (1989)', and 'A.B. Chaudhury–Kalyan Chakravarti, Sundarban Mangrove (Ecology and wild life), 1989'. The Mangrove forests are an ideal shelter for the varieties of plants and different species of wild animals. Indeed, few areas exist in the world with such diversities of plant and animal life. The Mangrove area is a peculiar terrain where man-eating tigers live almost as neighbours of man-eating ferocious crocodiles, poisonous snakes, sharks, lizards, birds, fish, turtles, honey-bees, crabs, and innumerable vertebrate and invertibrate species. While the distribution of flora is limited only to those species 'which could thrive under variable salinity, muddy substratum, periodic tidal inundation and adaptability to withstand cyclone, weather-hazard etc., the faunal component is not subjected entirely to such limitations. They have enough liberty to choose their suitable habitat for survival. Neither are they solely dependent on the physiography of the area.' 'Salt-water tolerance which is a must for the plant life to exist in this biota could not put equal hindrance to the faunal penetration.' The fact, however, remains that the two integral components of the Mangrove Eco-system are flora and fauna.

To maintain the Mangrove eco-system the flora and fauna should be preserved with sufficient care. The conservation of forests–plants and animals–forms is an important item on the agenda of Social Forestry programme of the Sundarban Biosphere Reserve. Yet irresponsible persons do not hesitate to fell down trees in the mangrove forests surreptitiously to eke out their income.

The importance of the mangrove eco-system is stressed by the artificial regeneration of mangroves, the experiment of which was made in 1982 by the Social Forestry Division of the Sundarban Development Board. It was financed by the International Fund for Agricultural Development. P.K. Roychaudhury, the mangrove specialist, connected with the cultivation programme in the Sundarbans between 1982 and 1989, is reported to have said that the mangrove plants raised artificially not only played an important role in balancing the eco-system but also provided economic benefits to the local people. Detailing the benefits, Mr. Roychaudhury said that the plantations supplied firewood, timber and minor forest products like honey and wax to the local inhabitants. Brackish-water pisciculture also received a boost. It is estimated that 'one hectare of mangrove plantation generates work for about 300 man-days.' The importance of Mangroves is all the more felt when we read that the Mangrove cultivation spreads to other neighbouring areas. In fact, a unique experiment in mangrove cultivation on Navachar island across Haldia has been undertaken by the Calcutta Port Trust 'as a form of bank protection.' 'This is the first time that mangrove cultivation is being carried on outside the original habitat, the Sundarbans.' (vide The Statesman dt 24.10.91 &5.8.91). The people of the Sundarbans have been long used to co-existance with the twin scourages of poverty and tiger. But in some areas like Rangabelia the scourge of the fury of Nature in the form of mighty waves of swollen rivers like the Vidya and Gomor has been causing inconceivable damage to cultivation by bringing paddy fields under water. Embankments could have checked the fury of Nature but the embankments – 3500 km long—have by now worn away and fail to check the rush of the river floods. The plantation of mangrove trees with their unique root-system is perhaps the best remedy against the damage caused by the fury of Nature. The utilization of mangrove trees for embankment purpose is also stressed by the Sundarban Biosphere Reserve Project.Still the local

inhabitants do not hesitate to cut down mangrove trees to eke out a living, oblivions of the utilization of mangrove plants as an alternative form of embankment intended to protect paddy fields against saline river-water. In fact, the Sundarbans now face a massive environmental attack. The plundering of natural resources, especially trees, for wood, by the local people to eke out a living alters the Sundarban delta's eco-system with alarming repercussions. Indeed, deforestation looks like a menace to the eco-system. The existing mangrove trees can hardly afford to give sufficient protection to the coastal areas against floods and cyclones. To many of the village people trees as environmental protectors carry little sense. They would not, therefore, hesitate to destroy the protective trees if by that way they get wood and fish they need. Damage to the eco-system also takes another form. Indiscriminate fishing for tiger-prawn seeds in the Sundarbans delta threatens to eliminate numerous other varieties of river-fish. According to experts, the process of catching tiger-prawn seeds destroys at least 72 varieties of Sundarbans fresh-water fish. (The Statesman dated 27.10.93). The tiger-prawn seeds find a ready market at Nazat, Basanti, Kakdwip and Dhamakhali. After four months' rearing, the seeds develop into prawns and are made ready for export markets by the big companies who obviously care little for the Sundarbans' future, as noticed earlier.

Exceptions apart, the majority of the people of the Sundarbans are now too conscious of their individual and collective well-being and desist from cutting down mangrove trees and fishing in an indiscriminate way. Avove all, for the protection and development of the region Government has established two organizations, the Sundarban Development Board and the Sundarban Biosphere Reserve which have a common aim, namely well-being of the men and animals of the region. Individual achievements of each of the two organizations have been highlighted in chapter VII above.

A noteworthy aspect of the Sundarbans study is offered by some humanitarian services of such private organizations as Ram Krishna Mission(R.K.Mission) and Tagore Society in the areas of Nimpith, Kaikhali, Rangabelia, and Satjelia.

Swami Budhananda of the R.K. Mission came to Nimpith in 1961 for rural services and founded there a Sri Ramkrishna Ashram.(Vide commemorative Souvenier Nimpith, 1986 25 years of rural development, Ramkrishna Ashram, Nimpith. Also Kaikhali Island Service Center Souvenier,1988). Within 23 years, the Swamiji

(honoured as founder-secretary) and his co-workers took the initiative in establishing at Nimpith a Krishi Vigyan Kendra (KVK) with the help of Indian Council of Agricultural Research, New Delhi, and a Marketing Centre with the funds sanctioned by New Delhi. The Swamiji also founded at the initial stage schools for boys and girls, a 30-bedded hospital, a library, a museum, and also organized a playground-cum-pavilion, a dairy-project, water-supply, a poultry farm and telephone-postal-and-transport services. While the KVK functioned effectively 'in imparting training and transferring need-based technology to the farmers' sons,' the Marketing Centre 'rescued the primary producers and fishermen from the exploitation of the middlemen.'

Before the foundation of the Ashram, Nimpith was 'a marshy thicket covered with bushes, jungles, and ditches. A high percentage of salinity in the water was the main hurdle for the villagers to grow double crops in those days. As a result followed poverty and unemployment. Small and marginal farmers and labourers used to earn their livelihood by cultivating Aman paddy during the rainy season and by making salt from the saline water during the summer. To them the period of 2 months after the rainy season till the period of paddy harvesting was a nightmarish experience. Many villagers were not sure of one square meal a day during this period. Situation has reportedly thoroughly changed at present. The villagers now feel sure of having two square meals a day at any part of the year together with other reasonably expected rural amenities of life. Agriculture has improved. Thanks to K.V.K. the farmers of Nimpith are being trained in modern agricultural technology and are helped in how to grow double–crop in their own lands. Road system has improved much. Brick-paved roads and tar-roads have removed the obstacle to movement from one village to another during the rains. In addition to Bus service on the main road, hundreds of cycles, cycle-rickshaws, and cycle-vans daily ply on the roads. The problem of drinkable water has been solved in Nimpith, it is reported.

In fact, the Nimpith Ashram has combined the teachings and ideals of Sri Ramkrishna with the rendering of a splendid service for the educational and economic uplift of the local depressed classes including the Harijans and Adivasis, 'enabling the poorest of the poor, the humblest of the humble, to rise from the morass of illiteracy and ignorance, economic stagnation, and degradation.'

In 1983, the R. K. Mission Ashram set up an Island Service

Centre at Kaikhali, an isolated belt, a slumberous Islet, within Nimpith. The Kaikhali Centre has ushered in a new era of hope among the long-neglected people there. The people there now get the benefits of a ferryghat, a primary school, a community hall, and a Police outpost. A Health Centre has also been proposed by the State Health Department. The economic development of Kaikhali owes much to K.V.K. Trainning has been imparted to 1,100 farm-families at the Kaikhali Centre. The Island Service Centre, as recorded in its Souvenir of 1988, made a noteworthy attempt to introduce the cultivation of cotton as a second crop towards improving the economic condition of the poor people of the Island. K.V.K. developed the technology of raising cotton seedlings in polythein bags and transplanting them thereafter in the main field 'after proper moisture condition was attained in the soil.' The State Agriculture Department is known to have accepted KVK's technology of cotton cultivation. '25 acres of cotton demonstration have so far been conducted in and around Kaikhali in the fields of 710 beneficiaries.' The introduction of cotton cultivation stood the poor Kaikhali farmers in good stead as they came to derive a profit of Rs. 300 per bigha of land after the Aman–paddy crop was raised, a benefit they were deprived of before the introduction of cotton cultivation. It is, however, reported that some technical defects led to the abandonment of the cotton cultivation project. A project entitled 'Economic Rehabilitation of the Resourceless Fishermen of Sankijahan', a village adjacent to Kaikhali, was undertaken by the R.K. Ashram and implemented by KVK in 1984. Fishing nets have been made available to the fishermen. A mechanized trawler has also been provided to a group of 12 fishermen for carrying the catches during the voyage. Since the implementation of the project, every fisherman is known to have been earning 'ten thousand rupees a year.'

The cultivation of sugar-beet in Nimpith-Kaikhali area is another significant achievement of the R.K. Mission Ashram. Sugar-beet is a salt-tolerant crop which can be effectively grown in the area between November and March when most of the lands lie fallow. On such lands sugar-beet crops can be grown and processed, as proved by experiment, for the production of industrial alcohol, a chemical in short supply in West Bengal. One such factory on a plot-basis has been set up by the Government of West Bengal at Neempith. 'This project will not only benefit the farmers of the back-

ward region of the Sundarbans but also help to rejuvinate the ailing chemical industry in the State. It has been estimated that with the cultivation of sugar-beet the income of poor farmers will increase by about 'Rs. 2,000 per acre of land' which yielded no income earlier. Thousands of acres of land which currently lie fallow in the winter season can be thus brought under cultivation, benefiting the small and marginal farmers alike. Farmers will be encouraged to form sugar-beet cooperative to cultivate the crop. (Vide Sujit Banerjee, Role of Agro-Industries with special reference to Sugar beet cultivation in the Sundarbans, pages 27-28, Kaikhali Island Service Centre, Souvenior, 1988).

Inspired by the same humanitarian spirit, the Tagore Society has been working for the socio-economic and cultural development of Rangabelia. With Tagore's inspiration for rural development, the Society was founded in 1969 with the late Loknayak Jayprakash Narain as Chairman, with a loan of Rs. 25,000/- from the Bihar Relief Committee of which Jayprakashji was the President. The project of the Tagore Society is known as the 'Rangabelia Comprehensive Rural Development Project'. Rangabelia is a small village on Rangabelia Island of the Sundarbans. It was initially an isolated island surrounded by saline -water rivers. Initially, the area suffered from extremely poor transport facilities and lack of the facility of electricity, and was also liable to high frequency of natural calamities, like floods and cyclones. Literacy rate was much below the national average (22 per cent). The Rangabelia Project achieved much in the course of a few year. The project, supervised by Mr. Tushar Kanjilal, started work in three contiguous hamlets of Rangabelia, Jatirampur, and Satjelia in Gosaba block with a population of 3,530 comprising 671 families. (Tagore Society for Rural Development, Rangabelia Project, p.8) Major stress has been laid on agriculture since its inception in 1975. It has introduced second crop in the predominantly mono-cropped region.

The main focus from the very beginning has been on the resistance to water-borne diseases and the provision for preventive care for all sections of the population. Drinkable water was made available to the core villages, with the result that the incidence of water-borne diseases fell sharply from about 65 per cent in 1978 to only about 12 per cent in 1988. The main health-centre with modern facilities is located at Rangabelia 'where people get quality medical

services at low cost.' (opcitp.9) Priority has been given to the training of the village-level workers who would help the needy people in remote villages 'with necessary knowledge of immunization, child-care, pre-and post-natal complications etc.'

Mahila Samity, the organization of women, has been developed as an wing of the Society. Literacy has been kept in front view. The literacy programme was taken in hand in 1978 with the establishment of 22 non-formal schools. In 1989, 504 schools functional with the help of Government agencies. Approximately 11,500 students have graduated so far from these schools. 'Currently this programme has been merged with Mass Literacy Programme of the Government, and instead of non-formal schools 100 adult education centres are running at Gosaba block.' (op cit p.10) Animal Husbandry and Veterinary Centre, active since 1984, covers within its network 155 villages (1615 families). Their main functions include immunization, providing technical assistance and scientific medical attention to the animal resources of the villages, promotion of fodder cultivation, artificial insemination, and running training programmes (opcit p.10). The performances of the cultural-wing have been known to be satisfactory. The rural environment seems to breathe a cultural and social awareness, heralding a new atmosphere in rural life.

The Tagore Society has also on its agenda many other useful rural development schemes for consideration in future. Below are presented three Tables to show the Society's achivements in some areas as at present.

Table I

Animal husbandry and veterinary Programme, 1984-1993.

No. of Blocks covered by A.H.and V. Programme	—	6
No. of villages covered	—	155
No. of families covered	—	1,615
No. of cows	—	55,230
No. of buffaloes	—	7,290
No. of goats and sheep	—	41,880
No. of ducks and fowls	—	85,840
No. of pigs	—	5,230
No. of families helped for fodder cultivation	—	5,112

Table II

Mahila Samity – Some activities, 1992-1994.

Names of the activities	No. of Blocks	No. of villages	No.of women benefited
Awareness Training camp (13 camps)	5	634	1,800
Agro-forestry (4,500 plants)	4	350	—
Kitchen garden	5	320	—
Arranging marriages without dowry	2	—	76

Table III

Some of the Performances of Comprehensive Health Project, 1990-1993.

	1990-91	1991-92	1992-93
No. of patients who attended daily clinic	4,984	8,785	14,126
No. of patients treated indoor	95	132	364
No. of deliveries conducted by trained Dais	991	1,749	1,950
No. of family planning operation	146	91	84
No. of X-Rays done	267	351	559
No. of DPT vaccines	4,912	7,439	5,521
No. of Polio vaccines	6,164	7,609	5,567
No. of Dais trained	34	148	112
No. of quacks trained	—	122	38
No. of Audio-Visual shows on health education	—	19	35

(Vide Introducing Rangabelia, Tagore Society for Rural Development, pages 19-20).

The rural development programme organized by the R.K.Mission and the Tagore Society, as presented above, was not reasonably expected to meet the wants of the poor of the entire Sundarbans area. The main beneficiaries were the people of Nimpith, Kaikhali, Rangabelia, and Satjelia, and the neighbouring areas. It is, indeed idle to expect in the perspective of the rural development of the entire Sundarbans that a few voluntary philanthropic organizations lacking in sufficient individual funds, and assistance from government and non-government agencies, could rehabilitate the 3 million rural population of the 19 Blocks of the region. Is it then the destiny of the majority of the Sundarbans lower-class people to live ever beyond the plimsoll line of poverty ? Even the darkest cloud may have its silver lining but the economic life of the Sundarbans poor (whether landed or landless) appears to remain murky without any promise of silver lining in the near future. Agriculture which is the mainstay of their livelihood remains sadly neglected by the government. Embankments, for instance, which function as the sentinels against the inroad of saline water of the Bay and estuarine rivers, so harmful to the cultivation of paddy and other crops, are not properly maintained, with the result that they often collapse before the ravages of floods, inundating large parts of the land-mass, killing cattle-life and destroying dwelling houses, as happened in May 1995 last. The May disaster is a 'sorry tale of the lackadaisical attitude of the West Bengal Government in approaching the embankment problem in the region' (The Statesman, 3.6.95, p.9). The embankments in many parts, as reported, are so fragile that they crumble at the slightest pressure. It has been the experience of the hapless villagers that 'just after the floods, when the water receded, the engineers would arrive and ask contractors to pour some earth at one point and some at the other before disappearing. This has been a yearly ritual for them.' (Ibid) Though the embankments at many areas have become extremely weak for want of adequate repairs and the sluice-gates are also in shambles, Government apathy persists. The State Government, it is reported, 'lost a golden opportunity of financial and technical assistance from a Holland-based organization towards constructing stable and efficient embankments.'(Ibid.) The study of the embankment problem by the Dutch experts (Mr. Zonneveld, for instance) revealed that government could not supply any data or research on the behaviour

of the Sundarban rivers — their current flow, silt content, and changes in course–, so essential to the experts undertaking the project of reconstructing the embankments. In the considered opinion of Mr. Tushar Kanjilal, Chief of the Tagore Society in Rangabelia, who has spent more than 30 years in the Sundarbans, 'the recent floods are just an indicator. If there is no organized and wholehearted effort from the government to solve the embankment problem immediately, the region will be wiped out of West Bengal's map within the next 15 years'. (Reported in The Statesman, 3.6.93).

A trend towards an investigation into the causes of rural poverty as opposed to urban wealth in the poor countries of the world has been in evidence as a socio-economic research enterprise in recent times. Among the researchers on the subject stands eminent the name of Professor Michael Lipton (Sussex University) who has attempted a thorough investigation against world perspective in his outstanding publication 'Why poor people stay poor—a study of urban bias in world development, 1977.'

The great division in the world today, according to Professor Lipton, is not between capitalist and communist or between black and white, or between east and west or even between rich and poor nations but between city and country. It is then the rural-urban migration that is held the salient, if not the sole, cause of division in the present-day world. This rural-urban migration was also considered by the present author in the current context as a major problem in his publication of the same year under the title *Internal migration in India*. Rural-urban migration paving the way for the urbanization of rural areas is largely responsible for the draining of wealth from the country-side into cities, creating a division between urban and rural areas. This urban bias is being seriously considered as a fundamental cause of rural poverty by scholars like Professor Lipton. If the income–gap between the city and the country is much larger in the Third World today than it was in the early development period of Europe and Japan, as argued by Professor Lipton, it is generally held as the result of the operation of urban bias. Moreover, 'public policy on investment, education, and prices pushes urban and rural incomes even further apart.' Even when, as further argued by Professor Lipton, resources are made available to farmers, they all too often go to big land-owners producing crops for the city-dwellers to eat rather than to small farmers. Cities, in fact, have

thrived at the cost of rural areas. The Cuban leader, Fidel Castro, also puts 'the onus of global hunger on over–fed rich countries.' (U.N. Food Summit in Rome on 17.11.96. The Statesman dated 18&20 Nov. 96).

'Since 1945, the output per person in poor countries has doubled,' as shown by Professor Lipton. 'Production has been made more scientific : in agriculture, by the irrigation of large areas and more recently, by the increasing adoption of fertilizers and of high-yielding varieties of wheat and rice; in industry, by the rising levels of technology, specialization, and skills. Consumption has also developed. Poor countries now consume enormously expanded provisions of health and education, roads and electricity, radios and bicycless.' Despite such developments since 1945, according to Professor Lipton, growth and development in most poor countries have done so little to raise the living standards of the poorest people. For this, foreign exploiters, domestic capitalists are generally held responsibile or again, the poorest are accused of the lack of initiative and energy and of being fond of a life of leisure. The alleged propensity of the poor or the rural poor to have too many children presses down the output per person to subsistence level. It is, however, difficult to justify that the poor are poor because they have too many children. Poor people, Professor Lipton argues, are not poor because of an irrational impulse to have large families. Because of too-much infant mortality the parents desire a number of children, expecting some of them to survive and help them in their domestic life and in their old age. If the infant mortality be arrested, propensity to have too-many children born to them will also be eliminated. Holding similar views Professor Lipton also writes: 'the cheapest way to reduce the number of children they have is to reduce the risk of child mortality, for example, by rural health centres — but to blame them for family structures forced on them by poverty is neither logical nor humane.'

Are then the poor people (against world perspective) destined to stay poor for ever ? 'Poverty persists alongside development largely because poorer countries are developed for people in cities: people who acting under normal human pressures deny the fruits of development to the pressure-less village poor,' as argued by Professor Lipton.

The antidote to poverty against world perspective appears then to stop urban migration or the flight of resources, food etc from

rural areas to feed urban centres. As early as 1977, the present author wrote : 'urbanization which gradually tended to be western-oriented created a deep-rooted crisis. Urban areas battened on villages but exported the virus of the western ways of living into them. Both Tagore and Gandhiji pleaded against the urban climate surcharged with western materialism. Gandhiji looked upon urbanism as an evil in so far as it as was based upon the exploitation of the villages. 'I regard the growth of cities, 'said Gandhiji, 'as an evil thing, unfortunate for mankind and the world, unfortunate for England and certainly unfortunate for India. The British have exploited India through cities. The latter have exploited villages. The blood of the villages is the cement with which the edifice of the cities is built. I want the blood that is inflating the arteries of cities to run once again in the blood-vessels of the villages. I do not want to depopulate the cities and send the city-folk back to the village. All I want is that they should readjust their lives so as to cease to sponge upon the poor village-folk and make to the latter what repatriation is possible by helping to resuscitate their ruined economy. (Quoted from the Author's Internal Migration, pp. 400-401).

The poverty of the Sundarbans poor may be viewed in the light of Professor Lipton's arguments presented above. While a certain percentage of the terrain may not feel the pinch of hunger, a larger percentage suffers, though the country is rich in resources. This is the mystery of the Sundarbans.

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